Journal of the Royal Society of Arts

NO. 5042 JANUARY 1960 VOL. CVIII

FORTHCOMING MEETINGS

WEDNESDAY, 30TH DECEMBER, at 2.30 p.m. The first of two DR. MANN JUVENILE LECTURES on '*Animal Senses and Reactions*', by J. D. Carthy, M.A., Ph.D., of Queen Mary College, University of London. (*Special tickets are required for this meeting.*)

FRIDAY, 1ST JANUARY, at 6.30 p.m. FILM EVENING. The programme will include '*The Glassmakers*' (to be introduced by Mr. L. S. Newton); '*Between the Tides*' (to be introduced by Mr. Edgar Anstey); '*Coupe des Alpes*' and '*The Story of the Motor Car Engine*' (full details were announced in the last issue of the *Journal*).

WEDNESDAY, 6TH JANUARY, at 2.30 p.m. The second DR. MANN JUVENILE LECTURE on '*Animal Senses and Reactions*', by Dr. J. D. Carthy. (Admission by special ticket, as for the first Juvenile Lecture.)

WEDNESDAY, 13TH JANUARY, at 2.30 p.m. '*The Training of Staff for Foreign Posts: a Dutch Experiment*', by Dr. E. B. J. Postma, Rector, Netherlands College for Representation Abroad. A. R. N. Roberts, of Imperial Chemical Industries Ltd., and a Member of Council of the Society, in the Chair.

THURSDAY, 14TH JANUARY, at 2.30 p.m. COMMONWEALTH SECTION. '*The Preservation of Game in East Africa*', by R. L. E. Dreschfield, C.M.G., Q.C., Chairman, Uganda National Parks Trustees. Peter Scott, C.B.E., D.S.C., in the Chair. (The paper will be illustrated with a film, '*Birds of East and Central Africa*', recently made by the American ornithologist, Bayard Read. Tea will be served after the meeting.)

WEDNESDAY, 20TH JANUARY, at 2.30 p.m. '*The Function of Management in Industry and Commerce*', by Sir Frederic Hooper, Managing Director, Schweppes Ltd. Sir Nutcombe Hume, K.C.B., M.C., Chairman, Charterhouse Investment Group Ltd., in the Chair.

TUESDAY, 26TH JANUARY, at **5.15 p.m.** COMMONWEALTH SECTION. '*Irrigation and Population in Pakistan, India and Ceylon*', by R. Maclagan Gorrie, D.Sc., F.R.S.E. Sir Harry Lindsay, K.C.I.E., C.B.E., a Vice-President of the Society, in the Chair. (Tea will be served from 4.30 p.m.)

WEDNESDAY, 27TH JANUARY, at 2.30 p.m. FRED COOK MEMORIAL LECTURE. '*Four Great Representational Portrait Painters*', by Sir Gerald Kelly, K.C.V.O., PP.R.A. Anna Zinkeisen, R.O.I., R.D.I., a Member of Council of the Society, in the Chair. (The lecture will be illustrated by lantern slides.)

WEDNESDAY, 3RD FEBRUARY, at 2.30 p.m. SIR WILLIAM JACKSON POPE MEMORIAL LECTURE. '*Modern Dyes*', by Clifford Paine, B.Sc., F.R.I.C., a Director, Imperial Chemical Industries Ltd. Sir Charles Dodds, M.V.O., F.R.S., Courtauld Professor of Biochemistry, University of London, in the Chair.

FRIDAY, 5TH FEBRUARY, at 7.30 p.m. FILM EVENING. The programme will include '*Kariba*, 1958'; '*Kariba Game Rescue*', and '*Teamwork*'. Full details will be announced in the next issue of the *Journal*.

WEDNESDAY, 10TH FEBRUARY, at 2.30 p.m. '*The Art of Glass Engraving*', by Miss Helen Monro, M.A., of Edinburgh College of Art. Paul Reilly, Director, Council of Industrial Design, in the Chair.

THURSDAY, 11TH FEBRUARY, at **1.15 p.m.** COMMONWEALTH SECTION (Joint Meeting with the Royal Commonwealth Society, to be held at Northumberland Avenue, W.C.2). '*The Commonwealth Education Conference*', by Sir Philip Morris, C.B.E., M.A., Vice-Chancellor, Bristol University. Dame Mary Smieton, D.B.E., M.A., Permanent Secretary, Ministry of Education, in the Chair. (See separate Notice on p. 83.)

MONDAY, 15TH FEBRUARY, at 6 p.m. The first of three CANTOR LECTURES on '*Some Aspects of the Fuel Industries*', by Albert Parker, C.B.E., D.Sc., F.R.I.C., lately Director of Fuel Research, D.S.I.R.

WEDNESDAY, 17TH FEBRUARY, at 2.30 p.m. Symposium on '*The Training of British Staff for Overseas Posts*'. Speakers: W. H. Beeton, C.M.G., Training Officer, Overseas Service; Philip Rogers, C.M.G., Assistant Under-Secretary of State, Colonial Office, and Dr. A. T. M. Wilson, Head of Unilever Training Division. A. R. N. Roberts, of Imperial Chemical Industries Ltd., and a Member of Council of the Society, in the Chair.

MONDAY, 22ND FEBRUARY, at 6 p.m. The second of three CANTOR LECTURES on '*Some Aspects of the Fuel Industries*', by Dr. Albert Parker.

TUESDAY, 23RD FEBRUARY, at 5.15 p.m. COMMONWEALTH SECTION. SIR THOMAS HOLLAND MEMORIAL LECTURE. '*Voluntary Service Overseas*', by Alec Dickson, M.B.E., Project Adviser to Voluntary Service Overseas, and Secretary, Commonwealth Studies Committee, The Royal Commonwealth Society. Sir Hilary Blood, G.B.E., K.C.M.G., Chairman, Commonwealth Section Committee, in the Chair. (Tea will be served from 4.30 p.m.)

WEDNESDAY, 24TH FEBRUARY, at 2.30 p.m. TRUEMAN WOOD LECTURE. '*The Exploration of Outer Space*', by A. C. B. Lovell, O.B.E., F.R.S., Professor of Radio Astronomy, University of Manchester, and Director of Jodrell Bank

Experimental Station. Oswald P. Milne, F.R.I.B.A., J.P., Chairman of Council of the Society, in the Chair.

MONDAY, 29TH FEBRUARY, at 6 p.m. The last of three CANTOR LECTURES on '*Some Aspects of the Fuel Industries*', by Dr. Albert Parker.

Fellows are entitled to attend any of the Society's meetings without tickets (except where otherwise stated), and may also bring two guests. When they cannot accompany their guests, Fellows may give them special passes, books of which can be obtained on application to the Secretary.

Official representatives of Companies in association with the Society may also attend, with one guest.

ERRATUM

It is regretted that on page 3 of the December issue of the *Journal* the time of the Commonwealth Section meeting on 26th January was wrongly stated: Dr. R. Maclagan Gorrie's paper will be read at 5.15 p.m. and not at 2.30 p.m. Tea will be served in the Library *before* the meeting.

COMMONWEALTH SECTION JOINT MEETING

The paper by Sir Philip Morris on 11th February, which is announced on p. 82 above, will be read to a joint meeting of this Society's Commonwealth Section and the Royal Commonwealth Society, to be held at the latter's headquarters in Northumberland Avenue, W.C.2. Fellows of the Royal Society of Arts wishing to attend will require special tickets, which may be obtained on application to the Secretary. These tickets will admit to the formal proceedings, which begin at 1.15 p.m. Fellows who wish to have a buffet luncheon (price 3*s.* 6*d.*) at the Royal Commonwealth Society beforehand, are asked to apply separately, at least 24 hours in advance, to Miss Poile, Social Organizer, at that Society.

ANNUAL RECEPTION

Intimation has been received that H.R.H. the President intends to be present at the first Annual Reception of the Society, which, as announced on page 6 of the December *Journal*, will be held at the Society's House on the evening of Thursday, 3rd March, 1960.

The Council is now proceeding with the organization of this function. It is not yet possible to announce details, but in order that an estimate may be formed of the number of those wishing to attend, Fellows are invited to apply now for tickets. These will be issued on the basis of allowing one guest for each Fellow, until they are exhausted, but a limited number is being reserved for overseas Fellows who will be visiting London at this time. Fellows are therefore advised to make written application as early as possible.

The cost of tickets to Fellows has not so far been ascertained, but it has been decided that this shall not exceed £1 5s. No money should be sent, however, until requested.

INDUSTRIAL ART BURSARIES EXHIBITION

A selection of the winning and commended designs submitted in the 1958 Industrial Art Bursaries Competition will be shown at the Falmouth School of Art, Kerris Vean, Woodlane, Falmouth, Cornwall, from 11th to 22nd January, 1960.

JOURNAL INDEX AND BINDING CASES

The index and title-page for Volume 107 of the *Journal* are now ready, and will be sent, free of charge, to Fellows who ask for them. Orders for binding cases (with which copies of the index and title-page are supplied as a matter of course), price 7s. each, should be sent to P. G. Chapman & Co., Ltd., Kent House Lane, Beckenham, Kent, who will also undertake the work of binding at an additional cost.

MEETING OF COUNCIL

A meeting of Council was held on Monday, 14th December. Present: Mr. Oswald P. Milne (in the Chair); Mrs. Mary Adams; Sir Hilary Blood; the Honble. G. C. H. Chubb; Sir Edward Crowe; Mr. R. E. Dangerfield; Mr. P. A. Le Neve Foster; Mr. E. Maxwell Fry; Mr. John Gloag; Sir Ernest Goodale; Professor R. Y. Goodden; Dr. Stanley Gooding; Dr. R. W. Holland; Mr. Antony Hopkins; Mr. E. E. Lawley; Mr. F. A. Mercer; the Earl of Radnor; Mr. Paul Reilly; Sir Gilbert Rennie; Mr. A. R. N. Roberts; Sir Philip Southwell; Professor S. Tolansky; Mr. G. E. Tonge; Mr. C. M. Vignoles; Mr. H. A. Warren; Sir Griffith Williams and Miss Anna Zinkeisen; with Dr. K. W. Luckhurst (Secretary); Mr G. E. Mercer (Deputy Secretary) and Mr. J. S. Skidmore (Assistant Secretary).

ELECTIONS

The following candidates were duly elected Fellows of the Society:

Adlington, Eric Noel, Elstree, Herts.
Andrew, Walter, A.M.C.T., Cheadle, Cheshire.
Bailey, Harold Roberts, M.A., Wisbech, Cambs.
Campbell, Sir John Middleton, London.
Chowne, Derek Arthur, G.I.Mech.E., Nazeing, Essex.
Clarke, Arthur Gordon, D.F.C., Newton Abbot, Devon.
Corps, John Frederick William, Norwich.
Daglish, David Michael, Darlington, Co. Durham.
Duckworth, John Clifford, B.A., F.Inst.P., A.M.I.E.E., Leatherhead, Surrey.
Ferriot, Joseph Victor, Akron, Ohio, U.S.A.
Firth, James Ronald, A.R.I.B.A., Hong Kong.

Fyfe, Professor Forest William, M.A., M.B., Ch.B., Halifax, Nova Scotia, Canada.
Gander, Frank Stanley, B.Sc.(Eng.), M.I.Mech.E., London.
Garnett, Charles E., M.E.I.C., Edmonton, Alberta, Canada.
Gee, George Maxwell, London.
Goble, Phillip Norman, B.Sc., Portsmouth, Hants.
Harker, Miss Margaret Florence, Harpenden, Herts.
Hewitt, Roy Gregory, A.L.A., Wolverhampton, Staffs.
Ingham Clark, Robert Alastair, London.
Keluskar, Jagannath Shankar, Bombay, India.
Lawrie, Christopher Godfrey, Kimberley, Cape Province, South Africa.
Lintott, Geoffrey Charles, N.D.D., Brighton, Sussex.
Marsh, John, Oswestry, Shropshire.
Mawdsley, Professor James Buckland, M.B.E., B.Sc., Ph.D., Saskatoon, Saskatchewan, Canada.
Meehan, Myles, Croydon, Surrey.
Micallef, John, B.A., Valletta, Malta.
Montlack, Miss Edith, New York City, N.Y., U.S.A.
Morris, William Arthur, Market Drayton, Shropshire.
Nicholson, Jack, B.Sc., A.R.I.C., Whitehaven, Cumberland.
Noel, Captain John, London.
Palmer, Frank Claude, M.A., Fulmer, Bucks.
Praat, Hubert Douglas, Abbots Langley, Herts.
Smedley, Gordon Owen, A.T.D., Bolton, Lancs.
Southgate, Reginald, Wembley, Middx.
Summers, Stanley, M.I.H.V.E., Cheam, Surrey.
Taylor-Cook, Charles Harry, B.Sc., M.I.Mech.E., Kenley, Surrey.
Tebboth, The Reverend Alfred Thomas Henderson, Rotherham, Yorks.
Trezies, John Raymond, London.
Wallis, Colonel Hugh Macdonell, D.S.O., O.B.E., M.C., V.D., Senneville, P.Q., Canada.
Watson, Fred, B.Com., Bishop Auckland, Co. Durham.
White, Ernest Arthur Sidney, Brighton, Sussex.
Widdowson, Timothy Penn, Wendover, Bucks.

The following candidate (an Examinations Silver Medallist) was duly elected an Associate of the Society:

d'Arcy-Kincaid, Miss Aevrille, Portstewart, Co. Londonderry, Northern Ireland.

The following companies were duly admitted into association with the Society:

Baker Perkins Ltd., Peterborough, Northants.
W. J. Bush & Company Ltd., London.
Dunlop Rubber Company Ltd., London.
Granada T.V. Network Ltd., London.
The Imperial Tobacco Company Ltd., Bristol.
Linoleum Manufacturing Company Ltd., London.
Joseph Lucas Ltd., Birmingham.
Patons & Baldwins Ltd., Darlington, Co. Durham.
H. & M. Rayne Ltd., London.
Rolls-Royce Ltd., Derby.

ANNUAL RECEPTION

It was reported that H.R.H. the President had signified his intention to be present at the first annual reception of the Society on 3rd March, 1960 (see separate Notice on p. 83).

MEMBERSHIP COMMITTEE

Mr. G. E. Tonge was appointed to succeed Mr. Oswald P. Milne as Chairman of the Membership Committee.

EXTENSION OF ACTIVITIES IN THE UNITED KINGDOM

Approval was given to the principle of a report submitted by the Future Policy Committee recommending the extension of the Society's activities in the United Kingdom by means of social functions held in major provincial centres.

BENJAMIN FRANKLIN MEDAL

Consideration was given to the 1960 award.

OTHER BUSINESS

A quantity of financial and other business was transacted.

PRESENTATION OF THE BICENTENARY MEDALS FOR 1958 AND 1959, AND OF SIX R.D.I. DIPLOMAS, WITH THE MASTER'S ORATION

At a Special Meeting of the Society held on Monday, 30th November, 1959, with
Oswald P. Milne, F.R.I.B.A., J.P.,
Chairman of Council of the Society, in the Chair

THE CHAIRMAN *opened the Meeting with these words:*

My Lords, Ladies and Gentlemen,

I am privileged to occupy this Chair tonight, for this is a joint evening of the Faculty of Royal Designers for Industry and this Society. On previous occasions when presentations have been made to new R.D.I.s, we have been honoured and fortunate in having our President, His Royal Highness the Duke of Edinburgh, here to make the presentations. You will be disappointed, of course, that His Royal Highness was not able to come tonight, but he could not offer any evening in the autumn when he could be present, because as you know his engagements are extremely numerous. So I have to do the job as best I can in His Royal Highness's place.

The Faculty of R.D.I. was founded twenty-three years ago. Every year it grows in prestige, and the title, Royal Designer for Industry, becomes better known to the British public, who are beginning to realize that anybody who can put those letters after his or her name is a first-class designer in his particular field. I should like to recall that it was through the initiative and farsightedness of Mr. J. A. Milne that this Faculty was formed. Mr. J. A. Milne is a namesake of mine, but though I should be proud to do so, I am not able to claim him as a relative (although the late Lord Asquith, who was at that time a Member of Council of the R.S.A., insisted upon calling us the brothers Milne, and I do not think he ever got it into his head that we were not related to one another!). Jack Milne did a great deal for this Society. He was Chairman of Council from 1932 to 1934, and it was his idea that an important industrial exhibition, the Exhibition of British Art in Industry, should be held. He managed to get the co-operation of the then President of the Royal Academy, and the exhibition took place in the winter of 1935 at Burlington House. It was a great success and made a lasting impression at a time when industrial design was not very much thought about. After the exhibition, Mr. Milne put forward the idea that the industrial designer ought to have some honour akin to that bestowed by the Royal Academy on painters, sculptors and architects, and he felt strongly that this Society—a Society which has always taken an interest in industrial design and has been a leader in industry since its foundation—should be the body to confer the distinction. He brought this idea to the Council of the Society. I was a new boy on the Council in those days, but they put me on to the Committee

which considered the matter and in due course we hammered out a scheme for conferring an honour on Designers for Industry in very much the same form as we know the Faculty of R.D.I.s to-day. Helping in all this, and an active lieutenant of J. A. Milne, was Sir Ernest Goodale, who is here tonight. These two men were really the architects of the Faculty. The Society took great care that the first nominations to the Faculty should include only the most distinguished designers, and when I tell you that H. G. Murphy, Keith Murray, George Sheringham, C. F. A. Voysey, Eric Gill and Harold Stabler were among the first recipients of this honour you will see how high a standard was set. Since then the appointments have been made by a Joint Committee of this Society and of the Faculty, which has kept the level of appointments to the original high standard.

I am now going to ask the Master of the Faculty to introduce the new recipients of this honour.

PROFESSOR R. Y. GOODDEN, MASTER OF THE FACULTY OF ROYAL DESIGNERS FOR INDUSTRY, *then spoke as follows:*

I have the honour to present five British designers for the distinction of Royal Designer for Industry, and one Danish designer for the distinction *honoris causa.*

First, he introduced MR. ROBIN DAY.

Mr. Robin Day's position among our leading furniture designers has been many times confirmed. Of the proofs he has given I would cite particularly the award he gained in the international competition organized in 1948 by the Museum of Modern Art, New York; for this success in international company of the highest class, within a few years of the end of the war, was a powerful stimulus to the whole body of British designers. In the first list of the 'Designs of the Year' awards by the Council of Industrial Design he was named for two separate works, and in the same year was given their Design Medal by the Society of Industrial Artists.

In exhibition design his reputation stands equally high and was made in the years that followed the war when there was not much to exhibit and the ingenuity of designers in concealing this fact was itself a sight to see.

All Days must obey the unchanging laws of nature, and it is a source of satisfaction to the Faculty that this one, though shining already so bright, still sees his meridian before him. When I remarked to a friend that we had secured Mr. Day's accession to our number he observed: 'Why then the Faculty is a lucky dog'. When I said that the sentiment was impeccable but the expression a trifle old-fashioned, he reminded me that every dog must have its day!

The Diploma was presented by the Chairman, and the Master then introduced MR. ABRAM GAMES:

Mr. Abram Games is the undisputed leader in British poster design, in which field his distinguished position was recognized by public honours last year. Whatever the subject presented to him, he seems to see straight to the heart of

the matter and to find, with unerring eye, the simple yet arresting visual symbol which will rivet attention, at once and lastingly, on the thing, the cause or the occasion on hand.

His work has been shown, often in one-man exhibitions by invitation, in many capitals in Europe, the Near East and North and South America. He has gained the first four places in an international competition (a matter of interest, perhaps, to 'each way' speculators) and so when he was awarded the first prize in the national competition for the Festival of Britain symbol, it was only as if the sturgeon had been sent to the sovereign as of right.

The voice that speaks from the hoarding to-day, when used with this degree of skill, is as loud and powerful as the trumpets which once brought down the walls of Jericho; but Abram Games has no part in destruction. On the contrary: the creative work of the designer, and of the poster designer in particular, who must conjure his material out of nothing but what his own wits can suggest to him, is not much different from the ancestral task of making bricks without straw. When you have your bricks you may use them in one way or another—and what better way than to build Jerusalem in England's green and pleasant land?

The Diploma was presented by the Chairman. The Master then resumed, introducing MR. HENRI HENRION *as follows:*

Mr. Henri Henrion is a designer with a secure international reputation earned in a wide field and particularly in exhibition and graphic design. France, Belgium, Holland and Switzerland all knew his work before he observed that this island was still largely composed of woods and pastures, fresh and new. From a wealth of achievement standing to his credit I would recall particularly the displays he designed for the South Bank Exhibition of the Festival of Britain on the themes of Agriculture and Natural History, for the undoubted excellence of which he was immediately honoured. His work was to be seen also in the New York World Fair of 1939 and has been shown in the appropriate museums and galleries in London, Paris, Stockholm and Budapest, New York, and many other cities of North and South America.

He has done much for the organization of his profession and much for the training of those intending to enter it. Thus there are few points at which the designer's work in the widest sense does not engage his versatile and witty mind, and always with results that fascinate by their ingenuity and command respect by the ability of their executive; indeed, we see demonstrated once again what was demonstrated to our forebears (those, that is, whose eyes were not full of arrows) long ago: that there is nothing a Frenchman cannot achieve if he will but change himself into an Englishman!

The presentation was made by the Chairman, and the Master next introduced MR. HANS SCHLEGER:

Mr. Hans Schleger has achieved high eminence in the field of package design posters, and exhibition display. He has the skill to harness a most sensitive and discriminating talent to the forthright business of the market place—of the Fish Market even, for a notable example of a branch of work in which he has

specially interested himself, the creation of what is called a house style, is that chain of shops, which is easily called to mind, in which not only the fish but everything to do with the 'mongering' of it, from the shop itself to the wrapping of the purchase, is fresh and gay and clean and appetising.

I would mention also his design of the symbol of the Design Centre, which has perfectly fulfilled the imperative requirement to be adaptable to, and effective in, a series of widely differing materials, sizes and contexts. In gaining this latter commission, which he did in limited competition, Hans Schleger may be said to have plucked his laurels from the very nursery where *Laurus Nobilis* is propagated; and indeed it appears that he himself is not unversed in horticulture and the lessons it offers. He observes that plants are for the most part confined by the low temperature of winter to a period of inactivity and rest, and that the species *homo sapiens* is not much different unless enclosed like a hot-house plant in an artificial climate of comfortable warmth; and so, with a kind yet cunning eye on the opposition, he is able somehow to contrive that few come up to 'Zero' and none rise above.

The Diploma was presented by the Chairman. The Master then introduced MR. BERTHOLD WOLPE:

Mr. Berthold Wolpe excels in type design and lettering; and I question whether there is a more exacting field in which a designer can win so high a place, where the precedents are so many and so good, and so well known, and where the characteristics which distinguish a fine design from an acceptable one are so subtle and refined. The names of his type faces—'Hyperion', 'Albertus'—carry a suggestion of classical grace and dignity which is indeed the essence of them. Dare I say that 'Albertus' seems to have been the first example of what is becoming a little more common in Bedfordshire and elsewhere—nobility displayed?

Faces are the stock in trade of the type designer, but this one deals in hands as well, being a scholar in calligraphy and a practical scholar too, with a large and beautiful book on the subject up his sleeve. If I mention in the next breath his association with the enlightened publishing house of Faber and Faber you will not suspect me, Sir, of having been hired to utter a publisher's blurb; for Berthold Wolpe, I understand, despite his evident modesty, is well equipped to call attention to himself, when necessary, with a few spirited bars on the hurdy-gurdy and a deerstalker on the pavement to receive the tangible applause. The hat suggests that one who follows in the footsteps of Baskerville may relax by following the foot-prints of that gigantic hound which helps to keep the name of Baskerville in print.

In welcoming Berthold Wolpe the Faculty wisely strengthens the foundations of its structure; for what work of the designer can be more fundamental than to add new beauty to the alphabet?

The presentation was made by the Chairman, and then, finally, the Master introduced MR. HANS J. WEGNER:

It is now my special privilege to present for the distinction of Honorary

Designer for Industry Mr. Hans Wegner, in recognition of his high achievement and influence in furniture design. It would be idle to pretend that relations between the Danes and the English have always been founded in friendship. Not far from my home are three steep hillocks, the Bartlow Hills—three little summits you might call them—which are said to be constructed from the bones left over after an Anglo-Danish conference of long ago; and it seems likely that it was the Danish 'requirements' of the same distant period that taught us to accept with such docility the highest level of taxation in the world.

But of late years there has existed a special, and precious, bond of sympathy between England and Denmark, and nowhere is this understanding more real and more cherished than among the designers of the two countries. We have an unreserved admiration for the work of Danish designers, more particularly in the domestic field and most of all in furniture. The Danes, we know, are generous in their admission that English design and craftsmanship in furniture have sometimes held lessons for them; now we as readily concede to them the palm. 'The best Danish furniture . . .', my immediate predecessor Dick Russell observed on the last such occasion as this, 'has come to be accepted as the best in the world.'

First among the best, we salute Hans Wegner as one who, himself excelling, has done much to encourage the excellence of others, and so it is with double reason that we honour him. Did I say we honour him? By accepting the distinction and by coming here to receive the diploma, he surely honours us.

The presentation was made by the Chairman, who thereafter proceeded to introduce MR. JOHN GLOAG, *recipient of the Bicentenary Medal for* 1958, *as follows:*

As you know, Mr. Gloag, the Bicentenary Medal was instituted in 1954 as a permanent commemoration of the Society's Bicentenary and it is awarded annually 'to the person who in a manner other than as an industrial designer has exerted an exceptional influence in promoting art and design in British Industry'. Last year the Council unanimously decided to award this medal to yourself, but owing to your absence in America last autumn, the presentation of the medal has been postponed until now, and the pleasant duty falls to me of handing it to you. We all know that as Director of a leading firm of advertising agents you are able personally to encourage good design in the fields of advertising and display. In a broader field, however, you have done much, and over a very long period, to stimulate the progress of good design both by your strong and active personal influence and by the many books and other publications on subjects relating to design which have come from your pen. As a recognition of the importance of your contribution you have already been made an Honorary Fellow of the Society of Industrial Artists and an Honorary Associate of the Royal Institute of British Architects, and the Royal Society of Arts is proud to honour you by awarding to you the Bicentenary Medal. I am happy indeed to present it to you this evening.

Introducing MR. FRANK A. MERCER, *recipient of the Bicentenary Medal for* 1959, *the Chairman said:*

Mr. Mercer, I cannot forget the invaluable work which you are doing for the Society as its Senior Treasurer, but this evening we seek to honour you for the great influence you have exercised in the field of industrial art. For many years you have been the Managing Editor of The Studio Ltd., and as editor of that famous Journal and also as editor of *Art in Industry* and of the annual volume entitled *Modern Publicity*, you have made the public aware of the value of good design in the whole field of industry, and have done much to raise the level of design and craftsmanship in every day goods as well as in the advertising arts.

Your efforts have been so continuous and so successful that they have almost been taken for granted. Nevertheless, your colleagues on the Council, and I am sure the whole Society with them, recognize the effectiveness of your long-continued and whole-hearted work, and we ask you to receive this medal in recognition of your outstanding claims to it.

The Chairman then introduced MR. H. G. NELSON, *recipient of the Benjamin Franklin Medal for* 1959, *in these words:*

The Benjamin Franklin Medal was, as you know, instituted by this Society in 1956 to commemorate the bicentenary of the election of Benjamin Franklin to membership of the Society. The terms of the award are that it shall be made 'to individuals who have attained early distinction, with promise of future achievement, in the promotion of arts, manufactures and commerce'. We feel that the outstanding work which you have done in the English Electric Company, of which since 1956 you have been Managing Director, has rendered you a most worthy recipient of this Medal. You combine an active personal knowledge of scientific and technical matters with an outstanding ability to manage the affairs of a great and important commercial undertaking. It seems you can manage not only inert material but men. The result is seen in the multifarious developments associated with your Company, and I am sure that the country generally, as well as your own Company, is receiving the benefits.

I therefore have much pleasure in asking you to accept this Benjamin Franklin Medal.

THE MASTER *was then invited to deliver the following Oration:*

FAITH AND FANCY

by

R. Y. GOODDEN, C.B.E.,

Master of the Faculty of

Royal Designers for Industry

May I begin by excusing and explaining my change of title? A few weeks ago, when I was casting about for a subject which would reward your attention in the concluding period of these proceedings, my eye was caught by a newspaper

report which seemed to offer a suitable text, so to speak, on which to hang my sermon. I wrote accordingly, but before I had finished there occurred, as will appear, an event to which I could hardly not refer. I recast my address, but now the title no longer fitted and a fresh one, one of a different *kind*, became necessary.

Now let me dispose of the already discarded title. Under the heading '£780 Paid for Ugly Tankard', *The Times* of 16th October recorded: 'The highest price of the morning . . . was . . . given for an exceedingly rare and excruciatingly ugly tankard and cover commemorating the taking of Portobello by Admiral Vernon ("Old Grog") in 1739.' The only feelings that this news could give rise to in the mind of the Master of the Faculty of Royal Designers for Industry, especially if he happens also to be a member for the time being of the Council of Industrial Design, were of profound relief that anything so excruciatingly ugly should also be so exceedingly rare, and of satisfaction that something as appropriate as a mug had been used to commemorate Old Grog. Why then was I conscious of a small but distinct sensation of illicit delight on learning of this hideous survival from the golden age of English taste, this piece of fancy goods (to use that pretty word in the pinched, derogatory sense of a Minister of Food dismissing from the national larder all those noble tastes that lie along the road from Stilton to Gorgonzola), this piece of fancy goods which by the sound of it was no better than what parades to-day under the same description at Blackpool Fair? This seeming waywardness of mine must clearly be investigated, so I stood myself in the corner and thought. I do not know whether my thoughts deserve your attention.

My momentary reaction, I find, is a luxury. Luxuries come outside the definition of what is essential or even important, but within the definition of what can contribute to the higher degrees of enjoyment. I find relief in the idea of this ugly mug only because there is enough of good design about nowadays for it to be possible for those who labour all the time in this field to experience occasionally a surfeit of it; and the feeling of surfeit occurs only because, while there is a lot of good design, there is not enough that is better still.

If I may for a moment and for the last time hand this rostrum back to the auctioneer, as I go round a collection of good British design I find too many things that feature in the catalogue as 'a ditto lot . . . a ditto lot . . .'. (I mean that there is a lack of distinct character. I do not mean to suggest plagiarism. Far from it. I am amazed by the amount of effort squandered by the designer in conscientiously avoiding the repetition of any detail that another designer—that he himself—has ever used before. If the designers of the golden age had done the same, not only would all the Adam chimneypieces that Adam did not design no longer be attributed to Adam, but half the chimneypieces that Adam did design would no longer be attributed to Adam either; more accurately, then, Lot 1959 is not 'A ditto lot' but—the auctioneer's last refinement—'A somewhat similar ditto'.)—Too many things, then, that feature in the catalogue as 'A somewhat similar ditto' and not enough of those entries in bold black type: 'A pair of very fine girandoles in the Abyssinian taste, etc.' which are

calculated to testify to the completeness of the auctioneer's education and to gather the vultures together.

Continuing the examination, I questioned whether the position can ever be much changed. Almost all the things we use must be made mechanically; mechanical processes, if they are economical, are not very adaptable, so that either the design must make few demands of the process or, if it makes demands, must expect to find most of them watered down by compromise decisions in the course of going into production. With each compromise a spark of the original design is extinguished. The design which comes through the mill without loss of sparkle is the one which had not too much sparkle to lose.

If this were true and were to remain true the course to pursue would be clear: to settle gratefully for the increasing flow of what is good and to look elsewhere—to the infinitely adaptable hand and eye of the artist and the craftsman—for what is even better. But is it true? In weaving, for instance, new as well as old, I find plenty of examples in which it is hard to imagine that any of the force of the design has been lost in production. The loom is a very ancient piece of production machinery and there is much more accumulated understanding of its use than there is of most kinds of factory equipment. May we deduce from this that with patience and perseverance we shall master other kinds of machinery equally well and learn to employ them as willing and untyrannical servants who will help us to realize and not force us to compromise? Probably; and if so, then my pause for refreshment from the Portobello mug is seen to be an ignoble, though mercifully brief, defection from the stern pursuit, and I am left standing in the corner—an inconvenient position to maintain because I want now to turn and look at this subject from a different direction.

At this point of change (without loss of momentum) in the career of a member of the Faculty of quite outstanding distinction—Sir Gordon Russell—it is not possible to speak publicly on any part of this subject without referring to his work; nor, I am sure, would his colleagues in the Faculty be content if I did not make some such reference. Thirty years ago, when I first met Gordon Russell, the tempo of his establishment at Broadway was in process of change from the slow heartbeat of the craftsman's workshop to the rapid pulse of the production line. On one side of the pleasant courtyard were the old things: ash and oak and yew tree, and beeswax, and love; and on the other the new: plywood and cellulose and the efficiency to succeed in a highly competitive market.

Gordon Russell, I now see, had already realized that he had in this small factory a proving ground for an infinitely larger and more important experiment, and the slightly withdrawn and preoccupied air that I sometimes noticed about him (I noticed it once again many years later when two American designers who had just been given his views on American automobile design had somehow ambushed him into a night club in Bond Street) and which I misinterpreted on the occasion I particularly remember as the natural anxiety of a very kind man, who was giving me notice after only a fortnight's experience, to avoid undermining a young designer's confidence—a task in which he typically succeeded,

this air was in reality the air of a man who had been using those workshops as a tactical exercise table and was now laying his plans for his long and brilliant campaign to besiege and storm the many strongholds of British industry in his fight to eliminate ugliness and dishonesty from the things with which we surround our daily life. A formidable undertaking indeed! In the context of 1932 a less able and less determined man might wonder whether he had the slightest hope of success.

Look now at the magnitude of the achievement. A clear appreciation of the task, a steady resolve in the tireless pursuit of it demanded by absolute singleness of purpose have led—are leading—a revolution. His singleness of purpose in particular was brought out by the recent exhibition of furniture made by his company during fifty years. His own designs—so fresh and sure, so strong in character—stood out, but designing was abandoned quite early because that work others could do. It was the much more difficult task of evangelism for which he has found himself uniquely equipped, and who can doubt but that his talent has been put to the fullest use? A soldier may be required to fight and a politician must be allowed to explain to him why he is required to do so. But Gordon Russell's native measure is Georgic, not Philippic, and we can only guess at the sacrifice made in spending these years away from the Cotswolds in London and the industrial cities of the Midlands and the North. 'O fortunati nimium . . .' Virgil *was* speaking of the countryman. Let us say it of ourselves who can see his work from so close a point of vantage: 'O more than blest by fortune'. Faith *can* move mountains; and what price now the ugly mug?

It was at this point that news came of the death of Sir Ambrose Heal and my attention was at once re-focused, with sharper definition, on the subject of my inquiry. To a student in Bedford Square in the 1920s Heals nearby was — Heals, and one would hardly have thought to wonder whether its particular reputation had been settled a few years, or decades, or centuries ago. It was, and is, one of the *great* shops, as has been remarked, like Worth, and Fortnum, and—but not so many of them survive when you come to think of it. Ambrose Heal, the genius of the place, was himself a fine designer and craftsman, and he too must have seen and settled very early the path his career was to follow. Here again is a shining example of the power of a clear vision and a fixed purpose, a demonstration, whose value in our context can hardly be overestimated, that by selling only what has been chosen for excellence of design, a large shop can command complete commercial success over a long—for all we know an unlimited—period of years. Heal's work, begun earlier and now completed, and Russell's, still in progress, are so closely complementary as to gain in concert a more than double force. When these two speak together there cannot be a dissentient voice.

Now my questions are answered. To one who sees clearly it is not of the first importance that at a particular moment there is this much good design and not enough that is better still. What is important is that there has been progress and that there is much more progress still to be made. The chase is still on, in some directions it has hardly yet got into its full stride; and if one of the team

must turn aside already for refreshment, why then an ugly mug is still an ugly mug!

How rewarding for me that my quest led me to consider, however briefly, the example of these two men. Russell we have. Heal we have no longer, and I conclude in tribute from the Faculty to one who was loved and honoured and great among us:

He was masterly in his work. He was faithful to his purpose. Scholarly, zestful, with all the presence of a great man, he held a position unique in the field we cultivate and he held it unassailed, unassailable for a great part of a lifetime. To those by whom the loss is still more tenderly felt let us offer sympathy with a true understanding that, while death must bring sorrow, the completion, in the fullness of time, of something great and good is the occasion also for thankfulness and joy.

At the conclusion of the Master's Oration, SIR ERNEST GOODALE *spoke as follows:*

I have not the oratory nor the wit of Professor Goodden, but I hope I have the sincerity to offer on your behalf a most cordial expression of thanks to him, not only for his oration, but for the delightful way in which he introduced the gentlemen whom we honour this evening. As well as being a craftsman in metals, I happen to know that Professor Goodden also has quite a flair for textile design, and in proof of that I would remind you of the knowledge he displayed tonight about how we can put the loom to the service of mankind. It has been a great pleasure to listen to you, Sir, and the Faculty are honoured in having you as its Master. While I am on my feet may I also say how grateful we are to you, Mr. Chairman, for presiding this evening.

I move a very warm vote of thanks to the Master.

The vote of thanks was carried with acclamation, and the Chairman then declared the proceedings at an end.

THE PRESENT ECONOMIC POSITION OF GREAT BRITAIN

The first of two papers by

C. F. CARTER, M.A.,

Stanley Jevons Professor of Political Economy in the University of Manchester, read to the Society on Tuesday, 10th November, 1959, with Oswald P. Milne, F.R.I.B.A., J.P., Chairman of Council of the Society, in the Chair

THE CHAIRMAN: It is usual, I think, on these occasions to have some man or woman in the Chair who knows something about the subject with which the lecturer is going to deal. I should confess at once that economics is a subject of which (except in the most elementary way) I am profoundly ignorant. That does not mean that I am not as interested as any of you and as eagerly anxious to hear Professor Carter's paper on this subject which conditions the whole background of our lives; I am in the Chair this afternoon as Chairman of the Council of the Royal Society of Arts since it seems appropriate that the Chairman should preside at the first lecture of this session.

Professor Carter is so well known as an economist that he needs no introduction to you. He has just taken up his appointment at Manchester University; before that, he was Professor of Applied Economics at the Queen's University, Belfast. This Society owes him a debt of gratitude, for he has been Chairman of the Committee on Science and Industry which was set up about seven years ago and which is just completing its labours. That Committee was set up by ourselves, the British Association for the Advancement of Science and the Nuffield Foundation to investigate the factors influencing the rate of adoption of scientific and technical ideas by British industry.

Before I ask Professor Carter to 'go in and bat', may I say a few words about the lines on which this Society is arranging its lecture programme in this and the following sessions. In the past, our lectures, although very interesting and very authoritative, have not been particularly closely related to one another. Now we have recast the lines of the programme, and are planning, over a period of three years, a series of lectures dealing with the principal industries of the country and discussing the technical, commercial, social and economic implications. Now we think those lectures should be of great interest, particularly to younger men and women in industry and commerce. We recognize that the hour at which we hold these lectures may be rather awkward for some. Perhaps we shall improve upon that at a later date, but we do hope that the employers will make it possible for their younger members to attend these lectures.

The following paper was then read.

THE PAPER

We live in one of the richest countries of the earth. Like many wealthy people, we are more conscious of the enviable riches of our neighbour Uncle Sam than of our good fortune in being preserved from the poverty which afflicts most of mankind; but the fact remains that as a nation we are well above any

reasonable poverty line, and if any of our citizens fall below such a line this is because we do not care enough, not because we cannot afford to help them. We are richer than at any time in our past history; we are able to discuss, without incongruity, as a serious possibility, the further doubling of our standard of living within a quarter of a century. It is true that several other nations have been (or are) advancing in wealth even faster than we are, but for this we are disposed to assign special reasons, and we are not yet conscious that we have fallen irretrievably behind in a race. We are in fact in a mood of confident expansion, and through the summer of 1959 the economic skies have been as free from cloud as nature's own skies in this remarkable year. You would have to look more than half a century back, to Edwardian or Victorian times, to find a period when things have gone so well for so long; and there have been times when we have almost seemed to recapture the mood of confident assurance of the mid-nineteenth century:

> . . . From Celts, Saxons, Danes, Normans . . . have come down with English nationality a talisman that could command sunshine, and plenty, and empire, and fame. The 'go' which they transmitted to us . . . this it is which has made the old Angle-land a glorious heritage. Of *this* we have had a portion above our brethren—good measure, running over. Through *this* our island-mother has stretched out her arms till they enriched the globe of the earth . . . Britain, without her energy and enterprise, what would she be in Europe?[1]

We can set alongside this Victorian purple passage the assurance of the contributors to the *Manchester Guardian Survey of Industry, Trade and Finance* in 1956:

> The spirit of industry is progressive, expansionist and free. . . . The crust that has been lying on this country for thirty or forty years is cracking and breaking up. . . . We found almost complete unanimity that this country is embarked on a venture in economic expansion which has gone beyond the point of no return.

These opening remarks may sound like an echo of a political broadcast during the recent election campaign. But this is not what I intend; for I believe that we must accept, not as a piece of political propaganda, but as a fact of history, that this is a period of exceptional economic success. Our difficulty in accepting such an assertion comes in part from the influence of the economists as the professional mourners of society, always eager to find loss and desolation to bewail. It is true (as they assert) that prosperity is never safe, that it is hard to advance without the risks of an inflation of prices, that we are greatly dependent on an uncertain foreign trade, that we could feel more comfortable if our international reserves were higher, that we have recently suffered a prolonged standstill in the level of industrial production, that many nations (including those most devastated by the war) seem to have achieved an even more striking economic success than ourselves. But such things were always with us; only those lacking in historical sense believe in a golden age of prosperity without its accompanying doubts and problems.

A more subtle attack on our morale is made by those who ask us what good it is that we should be able to show an increase in the indices of wealth. Are we

any happier or more secure for being richer? Our prisons are full, violence and theft are common, signs of nervous strain are often to be seen, life is overshadowed by the danger of total destruction in war. Much of our wealth is swallowed up by the demands of defence; another large part is needed to overcome the disabilities of a crowded urban existence—are we really richer for being able to pack ourselves like sardines into a Piccadilly train? Yet another part of our creation of wealth satisfies demands which are themselves created by the ingenuity of advertisers, or by the desire to keep up with the neighbours:

> As a society becomes increasingly affluent, wants are increasingly created by the process by which they are satisfied. This may operate passively. Increases in consumption, the counterpart of increases in production, act by suggestion or emulation to create wants. Or producers may proceed actively to create wants through advertising and salesmanship. Wants thus come to depend on output.[2]

Thus we cannot claim to be 'richer' in the sense that more of our needs are satisfied, for the needs are false needs, created in us by those who wish to sell us things. This (Professor Galbraith suggests) is a truth stoutly resisted by the conventional wisdom of the age, for 'it is a far, far better thing to have a firm anchor in nonsense than to put out on the troubled seas of thought'.

These are good debating points, but they are not proof against a resolute application of common sense. None of us would wish to equate happiness with material wealth; but we are none the less justifiably glad if our fellow human beings are freed from the restraints of poverty. Whatever deductions are made for 'unreal' elements in our creation of wealth, it remains true that in Britain the restraints of poverty have been greatly eased in the present century. But (and this is important) there is still a great deal to be done; millions of nineteenth-century houses, now passing into final decay, have to be replaced; there is much work still before us in education, health services, the treatment of delinquency and crime, the preservation of beauty, the patronage of the arts—work which is often held up on the plea of national poverty. I shall not start to question the rightness of further economic progress while the ugliness of our industrial cities remains to be remedied.

My purpose to-day is to suggest some of the factors which influence our state of material wealth, so that I may use them in my second lecture to predict our prospects. I shall deliberately wander far outside the field of economics, for I want you to realize that a narrow approach misses the essentials.

The goods and services which we produce have their origin in human skill and energy applied to the free gifts of nature. Britain does not, of course, have a very wide range of natural resources. It is usual to name coal as the chief of them, but much of the coal we have is costly to win, and it can no longer be said to provide an almost unlimited cheap source of power. We have a substantial (though inadequate) amount of fertile land, and a climate free from extremes; we have a comparatively good supply of that most vital industrial material, water. There is very little else of which our own land supplies an adequate amount. Ores, textile materials, wood, grain, petroleum must largely be imported.

Any small land area is likely to be so limited in its resources that its inhabitants must depend greatly on foreign trade. If the City of London were to set up as a separate state, it would be found exceedingly deficient in both agriculture and industry, and it would export most of its product of services and import almost all its material necessities. Neither the fact nor the degree of British independence on foreign trade are unique. What is special in our situation is that we have achieved a large, densely settled and prosperous population on an area of limited resources. No other great industrial power has grown so strong on resources so limited.

The disadvantage of dependence on foreign trade is dependence on the policies of others. In a permanently peaceful world, the self-interest of trading countries might perhaps serve the general interest. But we can neither assume genuine and universal peace, nor that countries will follow their economic self-interest. It is only too clear that the strong forces of nationalism, still extending their influence in Asia and Africa as they weaken in Europe, often make it impossible to do what is economically sensible, and encourage policies of industrial self-sufficiency at any price. It is, of course, right and inevitable that industry should grow in the less developed areas of the world, but the reasons which make every country want to manufacture its own bicycles and assemble its own cars must be found in politics rather than economics. The breakdown of the European Free Trade Area negotiations, which is already altering the line of development of British industry, can be traced not to any economic issue, but to the unpreparedness of British and French political thought for the necessary compromise.

The central feature of British foreign trade is that we buy essential foods and raw materials, and sell services (e.g., shipping, banking and insurance) and highly manufactured goods. We have benefited greatly (at the expense of those much poorer than ourselves) from the present abundance of food and raw materials, though we must remember that this abundance may not continue for long. We have so far succeeded in developing more complex manufactured exports to substitute for the simpler ones which have been shut out (or priced out) of foreign markets. The automobile factories of the Midlands have replaced the mills of Lancashire as the great support of our foreign trade.

The dangers of a large dependence on foreign trade have been to some extent lessened by the progress of technology, which makes it possible to have greater freedom in the choice of imports—Scandinavian wood-pulp in place of American cotton, as a textile material; aluminium in place of copper; synthetic instead of natural rubber. The progress of technology also yields the more complex manufactures which are needed as exports—aircraft, electronic equipment, nuclear reactors. In other words (to put the matter in its simplest terms) the deficiencies of Britain's natural endowment are made good by a better use of brains and skill, energy and enterprise. Our present prosperity suggests that we have had in the past a fair record on this matter (though detailed examination shows that it could have been a great deal better). Since we live in a world in which others are energetic and skilful, our chance of keeping our place in international competition

depends on what we can do to stimulate energy, to extend knowledge and to develop skill.

Nineteenth-century writers were disposed to regard vigour in business and technology as a gift from God bestowed in exceptional measure on the English (and still more on the Scottish) race. A similar assumption was often made by twentieth-century Americans about themselves, until a doubt began to arise that perhaps the Russians are even more favoured. The fact is that we know very little about the origins of enterprise—to what extent it is inborn in particular races (for instance, in the Jews), to what extent it is determined by education, and to what extent it is produced by the social environment. Nor do we accurately know what changes in educational methods, in incentives, or in other features of the social environment will stimulate a vigorous enterprise. We perhaps know a few negative things—for instance, that a massive and highly centralized system of administration is inimical to enterprise. But there is much still to be discovered. Our social habits and institutions have grown up from all sorts of incidents and accidents of our past history. It is only natural that some of them (for instance, the lines of division between trade unions in the shipbuilding industry, or the habit in some bodies of paying and promoting people by seniority rather than merit) should tend to obstruct economic progress, while others encourage it. Looking at other countries, we can see how their poverty is made worse by (for instance) a system of land tenure which encourages too much subdivision of the land, or by the use of wealth in ostentatious personal luxury rather than in the development of industry, or by a widespread tolerance of corruption. Clearly the accidents of history have given us social habits and institutions which are not too unfavourable to the creation of wealth. But are our habits changing for the better or for the worse in this regard? A hundred years ago Samuel Smiles was disposed to ascribe economic, cultural and artistic progress to unremitting hard work in overcoming difficulties. Was he right, and if so, will progress continue with a forty-hour week, canned entertainment, education made enjoyable rather than irksome, and the lash of necessity held back by the Welfare State? One only has to think of such problems to realize how much there is still for the sociologists to study.

An advanced and rapidly progressive industrial country needs large numbers of pure scientists, technologists, trained managers and technicians. In the earlier stages of development there is little need for concern about the existence of enough people of the requisite ability; the problem is to find them and to give them their chance of education. We may now be reaching a point at which the possible rate of economic progress will be determined by the supply of first-rate ability, and by the skill with which it is used to the best advantage. The right use of ability is a matter on which we still have a lot of thinking to do; the selection of ability (that is, the avoidance of wastage in the educational process) has improved considerably since the war, though there are still many social obstacles to the development of ability among children of manual workers.

But it is a mistake to think of the educational needs of industry in terms of series of specialists narrowly trained for particular jobs. When we talk of making

up our deficiency of natural resources by a better use of brains, we mean either that we are good at creating ideas, or that we are good at picking up and adapting ideas created by other nations—or both. (In fact, our record in the creation of new scientific knowledge is good; our record in adapting it to industrial use is patchy, and our ability to pick up ideas from other nations is greatly reduced by our common fear of foreign languages.) The creation of ideas is often the product of a collision of thoughts from different fields of knowledge, and the narrow specialist is not therefore the most effective innovator. The adapting of ideas, our own or those of other nations, for industrial use calls above all for a flexible and ingenious approach. Even if we look at the great numbers of those who will not be expected to create or adapt ideas, but only to carry out orders, it is worth remembering that a man's working life may extend far beyond the bounds of our knowledge of what he will be expected to do. We are educating boys and girls to-day, not just to enter a particular workshop or laboratory in 1960, but to carry out tasks, as yet unimagined, in the twenty-first century. It is far more important that they should be flexible, ingenious, broad in their outlook, able to see the full implications of a problem, able to learn new things, than that they should have stuffed their minds with a particular collection of facts. In judging the educational background of our prosperity, we must look to the broad purposes of the education of the whole man, and not think of our schools as factories producing specialized manpower. By this standard of judgement, British education has not served the country badly, but there are trends in public thought which may endanger its effectiveness in the future.

The prosperity of a country depends, of course, not only on the effort made now, but on what has been done in the past. It depends on the stock of capital which has been accumulated—not only the machines and buildings of industry, but the supporting structure of roads and railways, ports and airfields, houses for the workers and schools for their children. The British stock of capital is clearly large, though some people consider that the rate of addition to it is disturbingly low. This is a matter difficult to judge, but it is certainly worth remembering that a great part of our supporting structure of public facilities is old and out of date. We are therefore compelled to devote a great deal of effort to building roads, modernizing railways, clearing slums and such like activity; and in doing so we find ourselves with the same kind of disability as a new country, which has to provide basic facilities as a condition of getting on with the direct production of wealth.

The past also contributes to us a stock of ideas awaiting adaptation and use, and a labour force of varied skills and abilities, at present with a decided bulge in the middle ages. The adaptability of this labour force depends partly on the rate at which it is 'turned over' by retirement and new entry, and partly on the chances of re-training or re-directing people during the course of their working life. The possible speed of industrial change is clearly limited by the difficulty of adapting the labour force, and large changes can on occasions mean that workers are thrown on the scrap-heap of unemployment without a chance of alternative employment. The community is, quite rightly, unwilling to tolerate

long-term unemployment, and a conflict may arise between the desire for technical and economic change and the desire to avoid upsetting established communities.

Finally, the past contributes to us the framework of ordered society in which we live, which (in so far as it is well regulated and familiar) makes it easier to maintain a high level of prosperity. Because the law is generally respected and is not usually liable to arbitrary change, people are encouraged to plan ahead and take a long view. An insecure country, liable to civil war or dominated by crime, is likely to breed business men interested in large and quick profits from commercial deals, rather than industrialists who will lay down capital to give a yield in the future. Even income tax and purchase tax, which we do not usually consider to encourage the creation of wealth, have at least the virtues of familiarity and of reasonable certainty; the business man is not at the mercy of the arbitrary rapacity of tax-gatherers. Orderly systems of wage-bargaining and arbitration have in some trades replaced the trial of strength by strike and lockout. The complexities of the financial system have grown up over so long a period that they are familiar, and provision can be made for varied business needs in raising finance and in carrying out transfers. One only has to look at countries where institutions are half-formed and habits of behaviour are uncertain to see the benefit which Britain obtains from the mere fact of her long history and her economic maturity.

You will see from what I have said that it would be quite hopeless to try to explain prosperity by reference only to the ideas which are found in the writings of economists. Prosperity involves the possession of a lot of man-made capital: but why do people accumulate capital, and what are the conditions which encourage its accumulation and its proper use? Prosperity is in some way linked to technical progress, and this Society has for some years past been the joint sponsor of an investigation into the factors which influence the rate of application of new scientific ideas in British industry. This investigation has, quite naturally and inevitably, wandered into studies of education, management methods, administrative structures and social institutions. If you want to understand what makes the British economy work, you must at least be something of an economist, something of a historian, a geographer, a student of management and administration, an expert in education, a man knowledgeable about international affairs, and a sociologist.

What I have tried to list are the factors which affect our ability to produce. This is not quite the same thing as the factors which affect our standard of living. First of all, we have from time to time unused capacity to produce; in the 1930s we had millions of unemployed and much idle plant and machinery, and even in 1958 and to-day we have quite a lot of reserve capacity. It is not, of course, reasonable to expect every industry to be working flat out all the time, but we certainly cannot forget those influences which from time to time may cause substantial unemployment of men and machines for a period. Next, the product of those in paid employment has to support those who are too young or too old to work, or who (by social custom) do not go out to work. The social changes of this century have made it possible to make much better use of the

energies of women, but we have still to make an effective attack on the problem of the employment of old people. Social changes and the shifts of population-balance between age groups are constantly changing the ratio of 'workers' to those they support, and thus (so long as manpower is a limiting factor in production) changing the standard of living attainable on the average by individuals.

Nor must we forget two ways earlier mentioned in which the country's production is swallowed up so as to yield no true direct benefit to individuals: expenditure on armaments (and now also the exaggerated emphasis given, for military reasons, to space exploration), and expenditure on overcoming the disadvantages of a crowded urban existence. Arms spending is the competitive advertising of the nations, which no one dares to drop lest his rivals should take advantage of him. It will, indeed, be a happy occasion if we can ever seriously discuss the uses to which we could put resources released by disarmament.

Finally, there are variations in the terms on which we exchange for imports the large part of our products which we send overseas. In 1951 for instance, import prices were exceptionally high, and in consequence the standard of living attainable from a given level of production at home was lower than in previous years. In 1958 and 1959, the advantage has been on our side.

For these various reasons, it is possible for the change in the standard of living between two dates to be downwards while the change in production is upwards. Since 1952, however, the tendency has been the other way; the fall in the burden of arms expenditure (after correction for price changes) and the improvement in the terms of trade have allowed the attainable standard of living to rise faster than production. But, of course, people may decide not to use on their immediate needs all the extra income available to them; we must also take some account of saving, both personal and corporate. Personal saving was under £250 million a year during the post-war years up to 1951, but it then rose dramatically, reaching £1,400 million in 1958. This increase in saving represents, to the individual, a decision to do without things now, in order to have more in the future. The relation for the nation as a whole is more complex, but we should have found it more dangerous to the economy to add to our capital at the rate of the last few years without this increase in the willingness to save.

The prosperity of Britain in 1959 thus makes possible a high standard of living and relatively high personal savings. But is it a prosperity which can continue and develop, or does it contain influences which will cause it to decay? These are the matters which I propose to discuss in my second lecture, when I shall rashly assume the mantle of a prophet.

REFERENCES

1. Quoted by Samuel Smiles from *Blackwood's Edinburgh Magazine*, 1870.
2. J. K. Galbraith, *The Affluent Society*, Chapter 11.

DISCUSSION

MR. P. K. SHAHANI: Societies and organizations only progress to the extent that they can encourage the common man to do uncommon deeds, and it has been very

heartening to hear Professor Carter speak in favour of the education of the whole man rather than the specialized one. Could he elucidate as to what changes he proposes in the present educational system?

THE LECTURER: That, I think, is really a subject for a whole meeting. There are two comments that I should like to make. Firstly, I think there has been a growth in the tendency to think of education in narrow vocational terms—in terms of turning out people to meet some immediate industrial need; this, I think, should be resisted. The second, and obvious thing, is that we ought as soon as possible to arrive at the situation where some education in science is considered to be as much a part of the normal equipment of the citizen as knowing something about poetry or the plays of Shakespeare. The tendency to divide ourselves into two streams, the scientists and the rest, is a very unfortunate one and tends to encourage a narrow educational attitude.

MR. R. F. COLVILE (Hilger & Watts Ltd.): Not being an economist, I speak with trepidation, but what occurs to me to be the most vulnerable part of our economy is our reliance on foreign markets. In order to keep our present standard of living we have quite simply got to be able to sell overseas. The snag is that if the terms of trade move in your favour you are presumably making it much more difficult for the primary producing countries to buy from you. My crystal ball suggests that over a period of about ten years this gap will grow wider. The primary producing countries, seeing this, will turn to secondary industry and protection. As a result our relative rate of expansion will slow down.

This may not matter if the overall market goes on expanding, and I suggest that in fact we shall have to accept a relative but not necessarily an absolute decrease in our trade while the 'have nots' begin to catch up. Perhaps the lecturer will talk about this in three weeks' time, but I should be interested if he would like to remark upon this point.

THE LECTURER: Yes, I think what you say would be partly true. It would be more obviously true if the world was divided quite clearly into primary producers and others. But, for instance, some of the materials which we need we buy from the United States, or at any rate we can buy if we get control of United States dollars, and that is a market where we have succeeded in expanding our exports in recent years. So that it does not follow that your relevant markets are necessarily contracting because the prices of primary products in the poorer countries of the world are lower, since it may be that the important markets to you may be in other manufacturing countries.

MR. M. ZVEGINTZOV (National Research Development Corporation): I should have thought, taking a long view, that with the population of the world expanding and other countries developing, the demand for raw materials in the world will accelerate. One would have thought that the terms of trade would be rather against us, and if that is the case the external purchasing power of the primary producing countries should progressively increase. But there arises another point, whether in fact our position is going to be more difficult and whether taking the long view it might not be wiser, without delay, to start not so much to look at what now are the cheapest raw materials, but what are going to be the cheapest raw materials in, say, ten or twenty years' time. It is not so much a question of the expensive substitute to-day as of intensifying our research so that the inevitable raw materials of tomorrow will not be as expensive and unobtainable as they would be if we did not do long-term research to cut down waste of them and devise more flexibility in their employment.

SIR ERNEST GOODALE, C.B.E., M.C. (a Vice-President of the Society): In the early part of his address Professor Carter referred to the relatively slower rate of increase

in industrial production in recent years in the United Kingdom compared with certain other countries. May I ask for a little more explanation of this? It is a matter which worries me a great deal. If we have a full employment policy and are in fact fully employed it seems to me that productivity can only be increased by automation and other forms of modern machinery. Isn't it a fact that Germany and other countries have gone ahead a great deal faster than we have because they started from scratch? It is easy to multiply production twice when you are only very slightly employed, as was the case with some countries in the early days after the war. We started after the war with full production and have kept up a small but steadily increasing rate; but I think too much is often made of this increasing rate of production, particularly when Germany is given as an example. I am very interested to know how far the rate of France's production has increased over the last few years with the same machinery that she had before the war.

THE LECTURER: On this kind of issue the facts are very difficult to interpret, because it is very difficult to sort out the changes which are simply due to recovery from the war from the changes which represent this big long-term progress. I would have thought that the thing which ought to be causing concern is perhaps not so much the comparison between ourselves and Germany, which is very difficult to make for that reason, but the comparison between ourselves and Russia, where the rate of increase of industry is clearly very great by any standard, even after allowing for recovery from the war.

SIR ERNEST GOODALE: Professor Carter might perhaps take into account that Russia has developed from a craft basis from which we have departed long ago; I would have thought the rates are not, therefore, comparable.

THE LECTURER: Perhaps, yes.

MR. P. E. BUDGEN: Professor Carter told us at the outset that we have never had it so good. Would he affirm that we can have reasonable growth and also a stable pound, or does he think those two things are incompatible? At the moment we have just got out of a period of unsatisfactory progress and we are already wondering whether we are in for a period in which inflation fears will again hold us back.

THE LECTURER: Well, I am tempted to say that I have got to leave myself something to say next time!

MR. F. W. MCCOMBIE (Managing Director, Megator Pumps and Compressors Ltd.): I should like to ask Professor Carter whether he can give us his views on the problem of how to marry full employment with the greatest efficiency of production. He mentioned that during 1958 and 1959 (the years affected by the famous credit squeeze) our productive resources were not fully employed, and as an economist he tells us that in many ways it was a very good thing. The reason is that some firms are efficient, others are less efficient and some are very inefficient indeed. When anybody who can get some workmen and materials can make money, however inefficiently he works, the efficient firms are denied the services of men and use of materials that they could employ to greater national advantage because they are operating more efficiently. Now if the tempo of trade is reduced, as it deliberately was during the credit squeeze, it makes life much more difficult for the inefficient firm, due to increasing competition; and so some of the very inefficient firms go out altogether, and their workers and materials are released, and other firms are compelled to make themselves a little more efficient. That, as far as I can see, is the traditional way of raising efficiency in a competitive society. But it does mean that productive resources are never quite fully employed, so that there really is competition between firms. Can Professor Carter enlighten us a little on that problem?

THE LECTURER: Well, my own view is that this pause was not a very serious tragedy. I think it went on rather longer than was necessary to achieve the particular result, but I think you are quite right on the general point. At the week end I was entertaining an eminent visitor from Poland, Professor Oscar Lange, who is Chairman of the Economic Council of the Polish People's Republic. He said that one reason which caused them to be technically backward in Poland was that they were always working flat out, and therefore they never had time to introduce anything new or think up anything new, or to redeploy their resources in any way; and he was much troubled about how one could reconcile the need to increase wealth immediately by working everything as hard as you possibly could, with the need for change and progress. I think it is perfectly true that you cannot reconcile them completely, but yet that the pause in industrial production through 1957 and 1958 until the middle of this year went on rather longer than we might have hoped.

MRS. FARINA: I am not an economist, but it seems to me that if the undeveloped countries could be given aid, surely that would create a big new market from which we should gain and which would greatly contribute to our prosperity for the next, say, fifty or hundred years. I cannot see what would happen after that, when they had reached the same standard as ourselves. Human beings on the whole tend to spend their incomes on luxuries and a better standard of living. Could Professor Carter be so kind as to tell me what his views are?

THE LECTURER: Can I tell you in three weeks time?

MR. R. H. FRY (*The Guardian*): May I ask for Professor Carter's views on a slightly different subject, which he did not touch on? He very rightly mentioned that some people have doubts about the duration and the soundness of the great prosperity. Now one of the reasons for this wonderful feeling of well-being is that a great burden has been lifted off our shoulders—the famous dollar problem. There is not a shortage of dollars any longer. The reverse of that picture is that the Americans now seem to be running into the dollar problem and into a deficit in their own balance of payments instead of having everybody clamouring for dollars. An American industrialist over here the other day said that when he went to his bank in London and asked them to convert £100,000 into dollars they said, 'Do you really mean us to convert it into dollars?' This was the first time it had come home to him outside America, and he was beginning to wonder whether dollars were a stable currency. Since when has this been so? I was in Washington this summer and I looked in on a statistician friend of mine. He was doing some work on the American balance of payments, a sign of the times, because until recently this thing did not exist as a problem, and he suddenly said to me, 'Do you realize since when the American balance of payment has been in deficit? since the fourth quarter of 1949!' This came to me as a blinding flash of the obvious: the pound was devalued in September, 1949. Immediately the dollar started to weaken and it took about eight years for this to come to the surface. Now how far is our prosperity conditioned by what happened in 1949? Are we still living on the devaluation of the pound? I do not know. It is just one of my doubts. I should very much like to have Professor Carter's opinion on that.

THE LECTURER: This is a very difficult question. My guess is that this is only one among many influences. I think it is clear that we have been enjoying the advantages of devaluation in a way which at the time was very much obscured by the immediate follow up of the Korean War and the great price upheavals which it caused. But I should not have thought that really accounted for a large part of our present prosperity, which in a sense has got to be accounted for not simply in terms of the statistical magnitudes with which economists juggle, but also in terms of change in the minds of men—that they are willing to contemplate prosperity, to plan more

vigorously, to look ahead farther, and so on. And I do not think these changes are entirely due to what happened in 1949. I would put it as one among many influences.

MR. A. R. N. ROBERTS (a Member of Council of the Society): May I return for a moment to the question of education? Just one short anecdote: my sister had taught all her life under the London County Council, and when her school was evacuated to Somerset she decided to remain there, teaching in a very small and very ill-equipped village school. After she had been at the job some years a clever young H.M.I. came round and, knowing that my sister had taught in some rather more exciting places than the village she was then in, said, 'Miss Roberts, it must be a source of great disappointment to you that so few children from this school get open scholarships at universities.' My sister replied, 'Perhaps it is; but it is also a source of great satisfaction to me that so many children from this village are getting more out of life and putting more into it on account of their being at this school.' At that point the young inspector decided that he would move on to his next appointment.

Turning to commercial education, with which I have something to do: we very often run courses where there are syndicates of eight young men, of whom on the average nowadays, five are graduates and three are non-graduates, and the rather distressing thing to me as an observer is that I think it would be exceedingly difficult for anybody unequipped with the biographies of the students to detect who were graduates and who were not. Professor Carter is so right in stressing that a great deal more is required in industry than a high I.Q. The ability to drive yourself in a limited time to solve a problem is something that is often not apparently very closely related with the actual grey matter which the student possesses. Further, I think the companies have been deluding themselves by making much too high paper specifications for quite ordinary jobs. I have seen advertisements for lift attendants which many a Field Marshal would have hesitated to reply to because of lack of the necessary qualifications! Perhaps Professor Carter will agree with me that for a great many jobs in industry one far more important qualification than the applicant's I.Q. is what he has in fact done in the past and how he has behaved to his fellows in the jobs which he has previously held. Now this, of course, does not mean that industry and other walks of life do not need a relatively few minds of very high quality; what it does primarily need for ninety-five per cent of its people is a willingness to work with others. It is for these reasons that I am doubtful about the country's present educational policy, which seems to imply that by multiplying the number of university places you are multiplying the number of valuable citizens. Beyond doubt there are a vast number of people who will benefit from some form of higher education, but not necessarily from that of a university. In all the branches of higher education far more attention should be given to the quality of the work which the student can himself produce.

MISS N. K. FISHER (Board of Trade): May I ask a relatively factual question? I was very interested in what seemed to be an aside from the main theme of Professor Carter's speech—his remark about the effect of the failure of the free trade area on British industry. (I understood his reference to be to the original free trade area conception.) I was interested that he should find already some signs of change of direction in British industry as a result of this, and I should be very grateful if he would explain in what directions he sees this happening.

THE LECTURER: I think one sees it in terms of decisions to spend resources in acquiring plants on the continent of Europe when otherwise the resources might have been used here. A great deal of research which was done in various places on developing possible markets on the continent of Europe now has to be laid aside as of little immediate use; but alternatives have naturally been explored, and action is now beginning to follow.

THE CHAIRMAN: I should like to congratulate Professor Carter on the skill with which he has used the technique of those Victorian novelists who used to write their novels for magazines in monthly parts. They managed always to finish their chapter in such a way that their readers were held spellbound waiting for the next part, and under the stress of that for a whole month. Professor Carter has been very successful in making us feel that we want to hear the second part of his lecture in three weeks' time, and I hope that all present and perhaps others with you, will be here to hear it. Professor Carter has illustrated to us what an incredibly complicated business it is to try to plan for the future. My feeling is, if it is so difficult when your front is comparatively small, when you are trying to keep up with the Jones's of America and Russia, how incredibly difficult it would be if your ideals were something wider than merely increasing material wealth. Professor Carter's paper has raised so many interesting questions in one's mind that one would like to ask him a great many things, but I am sure you will wish me to thank him again for his most interesting talk this afternoon, and to tell him that we look forward to the next one.

The vote of thanks to the Lecturer was carried with acclamation, and the meeting then ended.

PROBLEMS AND PROSPECTS OF THE ECONOMIC POSITION OF GREAT BRITAIN

The second of two papers by

C. F. CARTER, M.A.,

Stanley Jevons Professor of Political Economy, University of Manchester, read to the Society on Tuesday, 1st December, 1959, with Sir Philip Southwell, C.B.E., M.C., Director, Kuwait Oil Co. Ltd., in the Chair

THE CHAIRMAN: Professor Carter is so well known in this country, and particularly so to the Royal Society of Arts, that it is quite unnecessary for me to introduce him. I cannot—like the Chairman of Council at the first lecture—ask him to 'go in and bat', because he is still in, and has put up a most prolific score; and, to continue the cricket analogy, he will continue batting well to-day.

His first lecture showed us how wide an economist must spread his net if he is going to provide a balanced opinion of the 'economics' of a country; and it also showed us how well able Professor Carter is to spread that net, and to cover the many aspects that he must include in order to provide that balanced picture. To-day his address is again of very comprehensive character in its terms of reference, so let me give him the maximum time to devote to this subject by calling on him now.

The following paper was then read.

THE PAPER

The most important thing that we know about the future is that it will be full of surprises. Economists have often been grievously wrong in their forecasts of what will happen; and this is nothing remarkable, for the economic events of the future depend on many political and social factors whose operation even a team of experts could not fully predict. Thus our economic prospects would be greatly changed if there were a large degree of disarmament; but who can say what probability should be attached to this desirable event? There is often confusion, too, between estimates of what is *attainable* (that is, within the bounds of possibility if everything goes well) and estimates of what is *likely*. The doubling of the standard of living in twenty-five years certainly appears attainable, but is it likely? In answering such a question it is tempting to err on the side of caution, to assume that it is probable that unfavourable influences will appear or will continue, but to take no credit for the appearance of new favourable influences. But indeed our knowledge of that notable date 1984 is so slight that little meaning can be attached to an estimate of what is then 'likely'.

Let us start from what is relatively unchanging. The known natural resources of the country are not likely to be greatly different in 1984. Some will have been depleted, some will have become less relevant to our needs, some will have been further developed, but (assuming, as I shall assume throughout, that there has been no major war) Britain is likely to remain heavily populated relative to her

natural resources. Just how heavily populated is difficult to predict. Our future population depends on the birth and death rates and on immigration and emigration. The birth rate depends in turn on the age distribution of the population (in particular, on the numbers of potential mothers at various ages) and on the social customs and ideals relating to family size. The death rate also depends on the age distribution—in this case, especially, on the numbers reaching the main 'dying ages'—and on the progress of medicine. In the 1960s the numerous post-war babies will be getting married, and (if the country is prosperous), they will get married early; indeed, there is some reason to fear an approaching collision between the age of marriage for girls and a rising school leaving age. Those who marry early are exposed to the 'risk' of child-bearing for a long time, and in any case there is no longer any ground for confidence that a rising standard of living means smaller families; in some social classes and countries the opposite is true. Thus the birth rate may well be high, and (although the rising numbers of old people will affect the death rate) further population increases appear likely. In prosperous times this country is attractive to immigrants, and the colonies of Irish, West Indians and others strengthen this attraction by making it easy for their friends and relatives to join them. The flow of emigrants will no doubt continue, but the golden opportunities of the Dominions are no longer quite so apparent, and there might be many years in which the net balance of migration would be inwards. For this and other reasons, the official estimate of a population of 56 millions in 1984 may well be too low.

In fact, if we have a prosperous quarter of a century, our vulnerability at the end of the period may be somewhat increased by a less favourable ratio of population to natural resources; while if we have a period of economic failure, the ratio of population to natural resources might remain much as at present. By 1984 a 'bulge' in the age-distribution will lie between 30 and 40, so that over most of the intervening period we shall have the advantage of a large number of young workers. It is an advantage, I suggest, mainly because they will recently have been trained, and therefore occupations which have been suffering from a shortage of trained workers will have an exceptional opportunity to make good their deficiencies. For instance, there will be a large number of graduates leaving the universities in the mid-1960s, and this should be a good opportunity to make up some of the shortages in the teaching profession.

But there is no reason to think that the combination of inherited and acquired qualities which we recognize to be genius, or first-rate ability, will be any more common than it is now. We know how to breed swift racehorses and giant ears of wheat, but not great men. The changing fashions of education, proclaimed with so much enthusiasm though they rest on an inadequate basis of scientific knowledge, may for a period be unfavourable to the development of the first-rate, because so much attention is given to the needs of those of lower intelligence. On the other hand, the frustration of ability by poor home circumstances may be less common, and we shall perhaps begin to give as much thought to the proper and economical use of first-rate ability as we now give to getting a high load factor for an aeroplane.

Doubtless the British character will have changed little by 1984; but the characteristic attitudes of nations do change, and there is reason to wonder if the softness of life in the mid-twentieth century (always assuming peace) may not lessen our power to advance in thought, discovery or culture, and make us less able to overcome unfavourable changes in our circumstances. 'It is doubtful whether any heavier curse could be imposed on man than the complete gratification of all his wishes, without any effort on his part', said Samuel Smiles: and again, 'An easy and luxurious existence does not train men to effort or encounter with difficulty; nor does it awaken that consciousness of power which is so necessary for energetic and effective action in life.' The Victorian moralist has, to balance these remarks, some sensible comments on the disadvantages of being too poor, preferring as his ideal the modest comfort obtained by relentless hard work. Economic progress has carried us beyond this, far towards the life of ease; it is typical of our age that obesity has succeeded malnutrition as a health problem. Was Smiles right, and if so, shall we be able to withstand the renewed difficulties which a rising world population may bring upon us in the next century?

But let us get back to 1984. The developments of scientific and technical education, now in progress, should greatly improve our ability to compete in the race to use new techniques. We must not think that we shall be the leaders in more than a few fields of knowledge, for much greater resources will be deployed in other countries, but at least we can be prompt copiers—which is almost as good as far as economic progress is concerned. But the proper use of science will never be assured until we can rid ourselves of the curse of excessive specialization. Familiarity with certain main principles of science should be as much the mark of an educated man as ability to write well, to quote Shakespeare, or to complete *The Times* crossword. I find it odd that so much enthusiasm should exist for broadening the education of scientists, and so little for repairing the manifest ignorance of the non-scientist.

With more scientists and technologists, we shall be able to use our resources to better advantage. What changes this will mean can only be seen dimly, for although the foundations for many of the applications of science to be made in the next twenty-five years have already been laid, the order and speed of development is unknown. It is the science fiction writers, rather than sober business men or academics, who seem to be best able to guess the future. My own guesses are probably far too limited. I find myself wondering, for instances, if we may not be ready for a considerable displacement of steel by newer materials, and for big advances in the preservation of food and in the creation of new processed foods. The great increase in the number of office workers, which has caused us to create so many new box-like edifices which disfigure our cities, may turn out to be a short-lived change; for a major displacement of clerical labour by machines may be round the corner. We shall have it in our power to make many things last longer, and to make them more easily repairable—clothing, motor vehicles, household equipment. The commercial pressure may, however, be in favour of 'built-in obsolescence', of creating fashion trades where none have existed

before, and changing the fashions which now exist more frequently. Perhaps we shall have the sense to resist this waste; but I doubt it.

I could go on guessing, but none of our guesses should be taken too seriously. It is more important to realize that change is now very quick; that a country desperately short of coal-miners can in a few years find that it has too many; that the next quarter of a century will strain our powers of adaptation, and will mean that a lot of people will have to learn to do unfamiliar things. As I suggested in my first lecture, we sometimes talk of our systems of education and training as though it were their duty to deliver to the industry of the country young people just trained to fill the gaps which worry us at the time; but it is much more important that we should educate young people so that they can in due course learn to do the tasks, as yet unknown, of the 1980s and the twenty-first century. Our ability to use the possibilities of technological change is lessened by craft rules which may limit a man for fifty years to the job which he entered as an apprentice at 15 or 16.

I have said that the progress of science means that we shall be able to use our resources to better advantage. I am not sure, however, if this is wholly true of our human resources. In the past we have needed great numbers of unskilled labourers, for the sake of their muscle power; we still use the unskilled, because (even where machines do what human muscles used to perform) we need people to watch and guide the machines. We may not call this an unskilled job, but it can often be picked up quickly by people of quite low intelligence. In another twenty-five years, however, we shall often find it better to guide the machine automatically, subject only to the distant interference of a very few technicians. I do not know how, in such circumstances, we shall find work at reasonable wages for those of low intelligence and for those who are handicapped. This seems to me to be one of the biggest social problems of the future.

So far I have kept my head so well in the clouds that the distinction between 'what might be' and 'what is likely' hardly matters. Coming a bit closer to earth, what about international trading conditions for the next twenty-five years? In considering this, I do not think that we should pay too much attention to trading arrangements with the Six or the Seven or any other group. These will influence the path of our development, but the changes they will produce are not so very big compared to the normal fluctuations and changes of trade. More fundamental matters are the future course of our terms of trade—the relation between the prices at which we buy and those at which we sell—and the general influence of economic nationalism on our ability to sell our exports.

It is self-evident that in the long run Malthus must be right; that if men go on multiplying like rabbits, they will eventually run short of food. A shortage of food (or of industrial materials) would be of great significance to Britain, because we depend so heavily on imports. In the long run (so it would appear) we shall find that food-exporting countries have less to send us, that our exports buy less and less of the food we need because it has become so scarce. But the 'long run' is a long time in arriving, and the heralds of its advent are under suspicion of crying 'Wolf'; agricultural productivity has increased, and great surpluses of

food have appeared in advanced countries (like the United States). Surpluses of some industrial materials have also appeared, and the terms of trade have for some time been more favourable than many economists dared to hope.

I do not know how long this happy state will continue; but I fear that one day the wolf will arrive, and we shall have a difficult adjustment to make. Even if no serious shortages trouble us in the years up to 1984, we have to reckon that rising output will require a constantly rising flow of many types of imports, and will thus depend on selling more and more in the export markets. The dependence is uncomfortably close, because we have no large reserves to fall back on, and it is uphill work selling more exports in a competitive and nationalistic world.

The penalty for trying to expand without a sure foundation of higher exports is a balance of payments crisis, followed by corrective measures which interrupt the expansion and cause a lot of dislocation and political stress. The ability to increase exports may thus turn out to be the factor which regulates the speed of expansion. Ideally we should like to progress with careful regularity, at each stage putting no bigger strain on our external trade than can be offset by vigorous selling of exports. But the ability to sell exports depends on factors which we do not fully control—for instance, the *relative* speed of inflation, here and overseas; so we must in practice expect to advance in a somewhat jerky manner, and occasionally to retreat. Thus I doubt if we shall in fact double our standard of living by 1984, for this would require a very high rate of expansion in some years, in order to offset years of enforced stagnation or recession.

Nevertheless, we have it in our power to become a great deal richer, and at the same time to improve our chances for the future by renewing some of our basic services—roads, railways, housing, and so on. But I doubt if we shall seem, to a visitor from Mars, very rational in using our extra wealth. There is (as Professor Galbraith has recently been reminding us) a persistent disparity between our willingness to provide, by personal expenditure, for direct needs like food and clothing, and our willingness to provide by taxation for communal needs. It is disgraceful, but apparently inevitable, that the slums of Glasgow, the industrial squalor of the Black Country, the coal tips of Lancashire, the Victorian prisons, the workhouses-turned-hospitals, the decaying schools should persist in a land which thinks nothing of brightening its existence with television, football pools and other inessentials. But I do not foresee in the next twenty-five years an improvement in the willingness to be taxed. Perhaps the most we can hope for is more resolute leadership in insisting that some of these evils should be lessened.

It may seem to some of you odd that I should discuss what may happen between now and 1984 without reference to political trends. It is, of course, not wholly irrelevant what party is in power. Conservative Governments are likely to give business men a sense of security, encouraging long-term planning; Labour Governments are likely to be less inhibited in the choice of corrective measures in times of difficulty. But it would be a mistake, I think, to suppose that economic progress is heavily dependent on forms of *ownership*. The dependence on forms of *organization* may be much more direct. The Labour

Party has, as I think unfortunately, identified public ownership with organization at a national level, and has thus tended to create bodies too big for effective management and lacking the stimulus of a competition of ideas. Some branches of private industry may likewise be getting too big, though in the private sector the inefficient monopoly seldom enjoys an assurance of a quiet life. It need not be assumed that the Labour Party will repeat in the future its past errors; it would certainly be an advantage if public attention could be directed to the real issue of management structure, rather than to the side-issue of ownership.

I have so far found no obstacles to the considerable improvement of national wealth between now and 1984. But it is worth remembering again what enormous uncertainties attach to any prediction. Disarmament could make a great difference, or a technical change in armaments which raised or lowered their cost. Changes in the developing countries of Asia and Africa are impossible to foresee, but certain to be of major importance; in particular, we shall need to adapt ourselves to whatever economic policies are chosen by newly independent countries. We do not know what people will choose to do with an increased income: will they seek larger homes, or more luxurious furnishings, or more amusements? What crazes, like those for hi-fi and tape recorders, will suddenly develop? What mistakes of policy overseas (such as might permit a slump in the United States) will affect the British economy?

These (and many others) are things which may affect the regularity and rate of progress. It is still more difficult to say whether on the average our resources will be in excessive demand, so that there will be constant upward pressure on prices, or whether we shall again find unemployment of labour the main difficulty. I see no reason to think that we shall allow really heavy unemployment, 10 or 15 per cent, to occur; but the trouble is that nowadays we regard 3 per cent or 4 per cent as 'heavy', and it is very difficult, perhaps impossible, to regulate the economy so closely that unemployment is always below 2 per cent but there is no inflation. In the long view of history, inflation seems a likely danger; on the other hand, swift technical change is liable to create pockets of unemployment, and it is quite possible to conceive of a period in which we shall suffer both from unemployment and from rising prices simultaneously. It is wise to recognize that our powers of control over the economy are imperfect and in part untried, and we should not assume that the experience of the 1950s will be a good guide to the 1960s or the 1970s.

Whatever rate of increase of production we achieve, it seems to me likely that a considerable part will be used up in offsetting the disadvantages of our urban existence. For instance, the growth in the number of motor vehicles means that an immense effort is needed to prevent a continuous slowing-down of traffic. Against the increase in the standard of living of a wage-earner who for the first time buys a car, there must be set the decline in the standards of all those who must go more slowly because an extra car is on the road—or else the decline in standards necessary to release resources to be used on road improvements. It seems to me very doubtful if it is possible to conceive of any plan for road improvement which will avoid hopeless congestion in the cities, for we have

so large a population in such limited areas. By heavier taxation or by regulation, something may have to be done to keep down the number of motor vehicles or to restrict their use in crowded areas—both changes for which public opinion is certainly not yet prepared. Yet in the absence of such action, there may be a very serious reduction of the real benefit to individuals of our extra wealth.

Other examples of such a reduction can be suggested: for instance, the tendency of improvements in health services to frustrate themselves by increasing the numbers of people who believe themselves to be sick. I must again remind you, also, that even where a real and large increase in material goods or services has been created, we may not be any happier, nor will human life necessarily be more dignified, beautiful or cultured. The real problem of 1984 is not the danger of economic failure but the danger of spiritual failure.

Perhaps you are asking yourself what there is in the two lectures I have given which might not have come from anyone with a reasonable knowledge of the more serious papers. Economics is not a mystery, like medicine, whose practice is limited to the trained and registered members of a craft. It is an attempt to think clearly and systematically about very familiar everyday things, to recognize true sources of information and know how to use them, to keep in the mind interconnections and complexities and distrust the spuriously simple solution. Those of my profession have no right to be heard with respect except that we make it our full-time job to study in the round what others know more fleetingly and partially.

Yet as you look at the prospects of the British economy you may like to remember that we are fourteen years from the end of a second great war, and in fourteen years from the end of the first war we had experienced long-continued mass unemployment, taking us to the trough of the worst depression the world had ever known. There is something more than luck in our change of fortunes; there is also a notable piece of economic clear thinking, which broke through to the consciousness of nations in the expositions of John Maynard Keynes. Governments no longer, as they did in the 1920s and 1930s, meet depressions by measures which make them worse.

As the nation and its individual business units meet the shocks and unexpected changes of the next twenty-five years, they are likely to need more economic clear thinking. They will not get it unless more men of ability can be persuaded to enter the profession, and unless economics and the other social sciences receive some greater but still tiny fraction of the endowments now available to the natural sciences. I look to this Society for the Encouragement of Arts, Manufactures and Commerce to stand for the view that there is more to manufacture than its technique, and its right encouragement needs the help of the social scientists as well as of the inventor and the designer.

DISCUSSION

THE CHAIRMAN: Professor Carter has given us two outstanding papers, and I hope that they will be widely read and so make us all think more. Having been associated with economists at various times and particularly in the category

known as 'management research', which to-day provides more and more positions for those who are prepared to take up economics as a profession, I have more and more realized the need for industry to approach many of their problems from the angle of the economist.

Professor Carter has raised the question of the desirability of ensuring a wider education for the scientists and all those in technical work, and for those who are not in technical work more scientific education: my experience is that this education is available in the cities, particularly in London, if the younger people will take advantage of it. To-day nearly all the larger business groups are providing technical education—so far as their own industry is concerned—for those engaged in the non-technical administrative sphere. I feel there is more opportunity of education available than we are apt to give credit for. I find when I go to other countries that they do not seem to appreciate how many of such courses there are in this country. A most important question is 'research', which Professor Carter has referred to. I believe statistics show approximately an expenditure of ten in America for every one in this country. I think that is about it, the ratio might be more, but it does make one feel that it is essential, not only to undertake more research in this country, but, if we are only able to spend a small amount by comparison with America and Russia, we must ensure that the research expenditure is directed towards helping the smaller firms and newer industries so that they can compete in their sphere with other countries. And now I am sure Professor Carter is ready to answer any questions.

MR. P. E. BUDGEN: Our speaker referred to the interest of the press in his last meeting. With reference to that, I suggest that he should have used stronger language in calling 'built-in obsolescence' 'waste'. I would have preferred him to have said 'sabotage'. I was also a little disappointed that when he was referring to what we should buy with our further work, he did not mention leisure. Leisure is the one economic objective which will never have to be revised. The size of it of course may vary; but the economist who does not have leisure—I do not suggest that our speaker does not!—as his ultimate objective has not got things in proper proportion.

I think Professor Galbraith said that our economy could not find money for slums, etc. Well—we all know the difficulty of increasing taxation, because it tends to spoil our incentive. In that connection, will the speaker give an opinion on whether a proposal that the government should take shares, without taking control, in various companies would be a means of getting money into the government's hands without interfering with incentives?

THE LECTURER: If I may first refer to one point made by the Chairman about research expenditure here and in the United States—we have got to face the fact that the difference is one of the inevitable effects of being a much smaller country. This means that we have both to run harder and also be more sure that we are not wasting our efforts. And this is where the question of the right direction of effort in research and development is very important, and one on which I think far too little systematic thinking has been done.

I entirely agree with Mr. Budgen about 'built-in obsolescence'. I am not sure that I agree about the subject of leisure. That is, I am prepared to agree for myself (and, I am sure, for a great many people in this room) that more leisure is an exceedingly desirable objective, but I am not sure that the same can really be said of the majority of ordinary wage-earners in this country. I doubt whether they put more leisure very high on their list of priorities, and whether they have any very clear ideas of what they would do with it. Perhaps the right priority is more thought on the right uses of leisure before we worry too much about providing it!

I do not think that schemes of government shareholding are very significant one way or another. I certainly do not think that they will provide an unsuspected source of great wealth for the public purse.

MR. HUGO O'HEAR: There are three points that I should like to raise with regard to Professor Carter's very interesting address. The first one is that he said, as far as I understand it, that Malthus was right in that if we followed up the morality of the rabbit warren, there would not be sufficient material goods to satisfy the demands of an increasing population. I hope I understood him correctly about that. He said it was self-evident. Why?

Secondly, Professor Carter referred to John Maynard Keynes in what I conceived to be laudatory terms. Will Professor Carter agree with me that Keynes thought that you could have a different standard of morality for a nation from that which you can have for an individual, and that nations could run into debt without having a notion of how they were going to meet these debts, conduct which we would not tolerate from any individual? My third point, and I wonder if he will agree with me about this, is that what we really require in this country is a large body of educated humans with a small knowledge of science rather than a large body of scientists without any humanistic knowledge.

THE LECTURER: I think that these points would deserve a lecture each. The point about Malthus' original argument was of course that human beings might multiply in geometrical progression, while the means of subsistence would grow less. The reason why I think that his ultimate rightness is self-evident is based really upon the fact that the greater part of the cultivable area of the world is now known, and that the trend of world population has now reached the point where numbers will double in about forty or fifty years; I see no chance of continually increasing the productivity of agriculture at that rate. I think we may do so up to the end of the century, but beyond that I think we have to recognize that there are limitations on what even science can do for us. However, this problem may be a long way in the future.

It is true, I think, that Keynes pointed out that a number of problems took on a very different aspect when looked at from the point of view of whole communities than they do when looked at from the point of view of the individual: that whereas it may be prudent in an individual to be saving in order to provide for the possible future needs of his family, it may be desirable for the community that he should not save. Keynes did not really do much more than point out the inevitable paradox. I do not think he was attempting to lay down a moral principle, but simply to point out what was an insufficiently appreciated paradox about the individual action and social action.

With regard to your third point, I am not sure that I should like to divide the world quite in that way. Must we forever be divided into humanists and scientists in this sharp manner? Can we not conceive of a world of educated men who are not so highly specialized in either direction? It is not necessarily true that the study of science must take up so much of a man's energies that he cannot be regarded as substantially a humanist as well. The trouble is that we magnify the distinction between the two classes of people because our educational system magnifies it.

MR. A. POWIS BALE: In the old days, fifty years ago, economics was prompted by an exercise of common sense and a sense of proportion. To-day the scope of this science called economics is very difficult for a man in the street like myself to understand. If I give an example of what I mean, my question will become clearer. In the paper to-day I saw quite an interesting letter from a lady who said how wonderfully she could iron shirts by means of a scheme of work. Later on, there was another person saying how she ironed shirts by means of a wonderful machine which did it in half that time. Now surely the science of economics should say which of those schemes is applicable. In one case you have a very expensive machine which you could not possibly keep busy for more than a fraction of the good lady's time.

THE LECTURER: It is very difficult to define what economics is, except by defining what people who call themselves economists talk about. I suggest that we are not

a closed group; we are to a large extent talking about ordinary everyday things, and a good deal of economics is, as you say, common sense. But the complications of the economic system, the extent of the inter-relations and the unsuspected relations which arise, have become so great that mere occasional part-time study does sometimes lead people astray. I think that is really the justification for having a group of people who make this subject a special study. You can define economics, if you like, as being concerned with the use of scarce resources. I suppose your example of the ironing machine provides an occasion of this. The right answer presumably depends upon the valuation which is placed on the housewife's time, and if you have got a community where the housewife's time is valued very highly, anything like an ironing machine which may save her time will have a chance of being useful and economic. I suspect that the fact about ironing machines is they are mostly bought by husbands for their wives, and it is tactful when giving presents to presume that your wife's time is extremely valuable. But I very much doubt whether you can make a rational case for thinking that ironing machines ought to be bought!

MR. DAVID A. R. HOWELL (Economic Section, H.M. Treasury): I should like to touch on two aspects of Professor Carter's lecture. The first concerns the 67 per cent of the world who are living near the margin or on the margin of starvation. It seems to me a little premature to-day and in the next twenty-five years to talk of the problems of affluence—and indeed it seemed to me that Professor Galbraith's discussion is premature when only a small proportion of the world are even likely to face this problem before the turn of the century. A far more interesting question to my mind is, what are the chances in the next twenty-five years of the affluent peoples accepting a cut or a slow-down in the rate of growth and enjoyment of their own benefits for the sake of raising the living standards of the undeveloped countries? How far will a balance of payments surplus be taken as the limit of the amount that we can give overseas or how far will we determine to go further? How far will we actually surrender some of the benefits which would otherwise accrue to us?

That is one aspect. The second question concerns disarmament. Professor Carter knows that Russian economists regard the prospect of disarmament with two-fold pleasure; one reason is because it is likely to bring a longer period of peace; the other reason is because it is likely to remove from the capitalist system what they regard as a major stimulus to demand, and thereby at the same time remove one of the main props of what they regard as a rotten edifice. I should like to ask how far Professor Carter regards this is a real problem on which the Russians can look with glee, or how far the Communist system also faces the same problem? If a disarmament programme begins will disruption occur in either system, and what influence will we have to bring to bear to slow down disarmament merely for the sake of stopping disruption?

THE LECTURER: I was specifically talking about the situation of this country and not of other countries of the world, but I certainly do not wish to suggest that we should not have in mind the very serious problem, not only of the existing disparity between the income available in different countries, but also of the fact that this disparity appears more likely to increase than decrease. This is politically and economically a very serious matter indeed. On the other hand, I think we must face the fact that there is a divided view about the best way of assisting the underdeveloped areas of the world; should it be by direct acts of help or should it be achieved in the process of getting richer ourselves?—that is to say by our making larger demands in the way of commodity imports and other things from them. I think, also, that however great the moral obligation to do something about this 67 per cent of the world, it is nevertheless a moral obligation which people in this country have not begun to appreciate. There are very few people who are prepared to contemplate a cut in their *own* standard of living, however much they may be prepared to cut somebody else's,

and it will require a long process of education before it is possible to give help in the form of a direct slowing down of advance here. So I doubt whether, in forecasting what may happen, this slowing down is a particularly imminent thing, although it may seem that it ought to happen.

The point about disarmament is an interesting one. I do not believe that the economies of the West are incapable of overcoming the disruption which will be produced by disarmament. If we completely abolished our expenditure on armaments, this would be a smaller change than we achieved between 1945 and 1947 in moving from a war towards a peace-time economy. But, of course, we should have to recognize that any rapid reduction of armaments would have a very severe effect upon particular industries, and extremely vigorous government action would almost certainly be needed to overcome the special economic stresses which would be caused. I should have thought the real point about the ability of the West to disarm was whether they would take the danger seriously enough to do something about it pretty quickly. I do not think that the problem is insoluble; that is, I do not think the economies of the West necessarily live on armaments; but we should certainly find it difficult to adjust ourselves to a world in which the armament demand was suddenly removed. So, I think, would Russia. She would also find she had specialized equipment which was of no further use.

MR. M. J. STEWART (H.M. Treasury): I was a little surprised that Professor Carter said we could not double the standard of living in twenty-five years, because this only means something like a 2.8 per cent annual increase in G.D.P. per head. This is not very much faster than the sort of increases we have had in the last eight or ten years, and there are a number of factors which are more favourable to us now, such as the fact that we have had big increases in investment for some time. I understood that it was in the overseas field where he thought this rise was not going to be achieved, because we did not export enough. I wonder what kind of worsening of the country's terms of trade he was thinking of, and what kind of rates of increase in exports he was thinking of as beyond us. Given this 2.8 per cent annual increase in G.D.P. per head, it must be possible to calculate the kind of increase in exports you are going to need to pay for the imports that that rate of increase implies.

THE LECTURER: I think that you are being too statistical! We do not know that the import content required for a given increase in the national product will continue the same. There is at least a danger that it might increase. The problem is not so much the effect on the terms of the trade as such, but the obstacles to world trade which may be put up by a series of nationalist and protectionist economies, and the consequent difficulty of achieving a steady increase in exports against a constantly changing series of obstacles. We may at the moment see that the markets are growing very nicely, but we know only too well that these markets are liable suddenly to be shut to us, and then we have to turn round and look for others; and it is the rate at which we can progress in constantly seeking out new areas for exports which seems to me to provide the real limitation on our progress.

MR. COOPE: Would Professor Carter not agree that where there is a likelihood of fundamental technological changes, then 'built-in obsolescence' is not 'sabotage', it is merely economic good sense?

THE LECTURER: Well, it depends on the kind of 'built-in obsolescence'. Let me take an uncontroversial example—I do not think it would be a good idea to make socks with built-in obsolescence, in the expectation that by the time they had worn out, better ones would be available. In fact, this is an industry in which a very marked increase in the length of life has occurred. It may be sensible to make a machine which is going to be worn out in five years, because there will be a better machine then available, and it is not always a good thing for industry to have the kind of machinery which lasts for fifty or sixty years. But I would have thought that the real

danger was in the field of consumer durables, where the rate of technological change may not be very great, and the extent to which change matters to the consumer may not be very great, but an effort will be made to create apparent change and to shorten the life of goods just in order to keep up the market. This seems to me one of the ominous features of the American economy, trying to induce changes of fashion and to produce things which will only last for the duration of the fashion.

THE CHAIRMAN: It is my very pleasant duty, on behalf of the Council of this Society, to thank Professor Carter for the two lectures that he has given us. They are two brilliant pieces of work. Obviously lectures of this kind, particularly from a well-known economist, require the most careful preparation. The Society will be very glad to have them in its records. There are one or two points I should like to make.

Professor Carter said that some of the problems affecting the next twenty-five years required a spiritual approach; that, I feel, really answers some of the questions there have been on the human side. As far as we in this country are concerned, we do have a human approach to these problems and in these days there is a change of approach, particularly from the humanity angle, to the world problems of improving the standard of living. It is not just a question of more taxation, but of a better approach, and I think we in this country have much more faith in the future.

I should like to conclude by again saying how much everyone has appreciated Professor Carter's lectures.

The vote of thanks to the Lecturer was carried with acclamation, and the meeting then ended.

BLINDNESS IN THE COMMONWEALTH

A paper by

JOHN WILSON, O.B.E.,

Director, Royal Commonwealth Society for the Blind, read to the Commonwealth Section of the Society on Thursday, 12th November, 1959, with Godfrey Robinson, C.B.E., M.C., Chairman, the Royal National Institute for the Blind, in the Chair

THE CHAIRMAN: Most of those present will know Mr. Wilson, but just in case somebody does not, may I say a word or two about him? He was blinded when he was about twelve years old, in a laboratory explosion. He then went to the Worcester College for the Blind, where his quite outstanding progress led him on to Oxford University. At Oxford he took a degree in law and a diploma in social science. Then he went to the Royal National Institute for the Blind as Assistant Secretary. Just after the war, in 1946, the Colonial Office approached the R.N.I.B., asking it to collaborate in a study of blindness in the Colonies. As a result an investigating team was sent out to Africa, and in 1947, I think it was, they issued a very full report showing the extent of blindness there and suggesting some very far-reaching steps in remedy. Much study and consultation followed, as a result of which in 1949 the British Empire Society for the Blind was formed, and Mr. John Wilson was appointed its Secretary.

The expenses of the investigation I have described were shared between the Colonial Office and the Royal National Institute for the Blind, and on the formation of the British Empire Society for the Blind each of these two bodies put up £10,000 to carry it over the first three years. Since those years elapsed, the Society has been responsible for its own finances. During these ten years under the direction of Mr. Wilson the Society has made astonishing progress, and it can already show great achievements in the Colonies and Commonwealth. As you all know, the Society has now become the Royal Commonwealth Society for the Blind, and has as its Patron, Her Majesty The Queen. For his services as its Director, Mr. Wilson, most deservedly, was appointed O.B.E. This year at the meeting of the World Council for the Blind in Rome, at which 49 nations were represented, he was elected Chairman of the Prevention of Blindness Committee; I know of nobody who is better equipped for that work.

The following paper was then read.

THE PAPER

A few weeks ago, in Nigeria, I revisited a community which can fairly claim to be one of the oddest in Africa. It is the guild of blind beggars, seven hundred of them with their families, who live in Dhala, the 'blind quarter' of Kano City. Sarkin Makafi (the king of the blind) regulates the affairs of this guild with the help of the blind Elders. He denies that the guild members are beggars in our sense of the word; in Islam alms-giving is a religious duty, not just a

social virtue, and by organizing themselves for the receipt of alms, the blind members of the guild claim that they provide a civic benefit at least as valuable as that of the other guilds of leather workers, weavers and metal craftsmen. Each morning they make their way along the twisted cobbled streets of the old city to the mosques, the markets and the houses of wealthy traders. In the evening they return and their takings are shared out in accordance with a complicated formula by a blind official whose Hausa title, I was told, could best be rendered in English as 'Chancellor of the Exchequer'. Over the years, members of our Society have come to know and respect these sturdy, independent blind men of Kano, but when I first visited Dhala in 1947 they threw stones at our car and their accuracy of aim would have gratified any rehabilitation expert.

Further west, in Northern Ghana, is an area which without much exaggeration has been called 'the country of the blind'. Simulium flies breed prolifically in the northern tributaries of the Volta and the minute worms which they carry cause onchocerciasis, a blinding disease as ugly as its name. In some of the stricken villages, where a tenth of the people are blind, a hemp rope guides the women to the well and the men plant in straight lines along a length of bamboo. The community has for so long lived under the menace of the disease that they have come to regard blindness as normal and are frankly surprised that the authorities nowadays make so much fuss about it. When, after the fullest explanation, one of our teams proposed to disinfect a local river with insecticide, the village people petitioned the local authority to have the campaign stopped; they were afraid that we might kill the fish.

Outside a mission which flanks the road leading down to Lake Mweru in Northern Rhodesia is a notice which reads 'Drive carefully—blind people'. A survey made in eighty-five of the lakeshore villages showed that one adult in every forty and one child in every thirty is totally blind. This was caused by measles epidemics, but it was not so much the measles which caused the blindness as the extraordinary concoctions which the tribal medicine men used to treat the inflammation.

I have described these communities not from any wish to horrify but because, in a talk which attempts to see this problem on a Commonwealth scale, it is so easy to lose sight of the people behind the statistics. Moreover, these communities—and there are others like them in parts of India, Arabia, Borneo and the Pacific Islands—have this in common, that in practically every instance the blindness results from a cause which nowadays could be prevented. They therefore illustrate a main theme of my talk, which is that in this terrifying modern world we have an opportunity not possessed by any previous generation to tackle, and possibly to control, some of those basic human scourges of which blindness is almost the classic example. To this I would add my conviction that in the modern Commonwealth, with its capacity to bring together extreme skills and extreme needs, we have a better chance than any other group of nations to tackle those problems on an impressive scale. The present Commonwealth movement for the blind, the scope of which is little known even to many people who know much about the Commonwealth, is particularly interesting in

this connection because it is developing forms of partnership which may well have an importance beyond the immediate objective.

Nobody knows how many blind people there are in the Commonwealth, but the number certainly exceeds three million. The largest number, more than 2,300,000, is in India, Pakistan and Ceylon. There are at least 600,000 blind in the Colonies, Protectorates and trust territories, and about 80,000 in Ghana and Malaya. By contrast, there are only about 130,000 blind people in the United Kingdom, Canada, Australia and New Zealand. Some comparisons may help to bring out this disproportion—Hong Kong has more blind than the whole of Australia, Singapore almost as many as New Zealand; Northern Nigeria has twice the number in the United Kingdom, and there are more blind people in and around Calcutta than in the whole of Canada.

Figures such as these leave no doubt that this is a problem of major proportions and that the case for effective action rests as much on economic as on humanitarian considerations. In the past it was understandable that, particularly in Africa and Asia, blindness presented itself as just another of the distressing but unavoidable infirmities of mankind; that view was never shared by the pioneers of work for the blind and has now been finally dispelled by the realization that two-thirds of all the blindness in the Commonwealth is preventable and that great numbers of blind people who now live in misery and want could be retrained for productive life. Nor is this any longer a matter which Governments can deal with simply by passing it on to the missionaries or to unsupported charitable effort; Government action is necessary and, on a broader scale, the whole mechanism of Commonwealth collaboration.

It was such ideas which led to the formation of the Royal Commonwealth Society for the Blind, which in a few weeks time will be ten years old. The Society had the advantage of distinguished parentage: from the Royal National Institute for the Blind it inherited the finest traditions and standards in blind welfare and a belief in the effectiveness of voluntary action; through its other parent, the Colonial Office, it received an experience of overseas conditions and that support of the Colonial Governments without which little progress could have been made. It benefited also from the example and encouragement given by pioneer workers in a number of territories who, often not even realizing that they were pioneers, had tackled the problem which they saw around them and had shown how, in their own locality, blinding disease could be reduced and a new hope could be given to the blind. However, when the Society opened its first tiny office in Victoria Street ten years ago and we looked at the minute budget, it seemed altogether unlikely that this was the starting point of a major advance in work for the blind.

The first requirement was for effective national organizations in the countries where blindness was most prevalent. Often they began with a single individual who formed a committee which became a branch and later developed into an autonomous affiliated Society. Such national blind welfare organizations now exist in twenty-five Commonwealth countries which had none before. Their efforts have made possible the establishment of twenty-eight schools for the

blind and forty-five employment centres, with the result that in the Colonies alone the number of blind students and workers has multiplied more than tenfold. Surveys into the extent and causes of blindness have been conducted in areas containing more than twenty million inhabitants, and research has brought within reach methods of controlling some major eye diseases. Blind welfare experts, some themselves blind, have been stationed in many countries, and teachers and social workers have come to the United Kingdom for special training. Braille alphabets have been devised for the principal languages of the area.

At the outset, the Society was conceived as the centre of a United Kingdom effort for the blind of the Colonies. It soon became clear that this conception was too narrow and that our link with the blind of a particular country, and the work we had become involved in, would not be interrupted by a change in that country's constitutional status within the Commonwealth. Even more encouraging was the evidence that blind welfare organizations in Canada and in other leading member countries of the Commonwealth were ready to join with the United Kingdom in this movement which, with their help, might be extended to include the Asian dominions. Accordingly, in 1957, the Society changed its name and amended its constitution and is now gradually moving into its new rôle as the co-ordinator of a movement for the blind in the less advanced countries of the Commonwealth. In this growth, which in some ways reproduces in miniature the evolution of the Commonwealth itself, the Society has been influenced not by political considerations but by the practical necessities of the work it had to do; that, perhaps, is a useful testimony to the strength and practicability of the Commonwealth idea. Interesting also is the way in which this work has by-passed barriers of race and politics; in Cyprus, Greek and Turkish children lived happily together at the blind school throughout the communal tensions on the island; in Kenya, a mobile eye clinic worked in the Kikuyu villages despite the Mau Mau troubles, and in Malaya even the bandits are said to have subscribed to the appeal.

An important part in the story must be assigned to the surveys which were made to ascertain the extent and causes of blindness. A few years ago, estimates in Africa and Asia were largely guesswork and it was understandable that Governments, with many well defined problems to deal with, were disposed to take the most optimistic figures and assign low priority to work for the blind. It was an exasperating preliminary to have to count heads when the urgent need was to cure eyes or train hands, but there was no other way to convince the people who controlled the budgets. Our survey in West Africa developed into the most extensive operation of its kind ever undertaken in the tropics. It involved four years of field work by two mobile teams, one under an entymologist which was concerned with River Blindness and the other under an eye specialist which investigated the causes of blindness in an area containing twelve million Africans. The survey presented some extraordinary problems! Dr. Rodger, with his mobile operating theatre, three vehicles and two tons of specialized equipment, travelled over 100,000 miles in four years across some of the worst country in

West Africa; they made the long haul from Northern Ghana to the Cameroons, and theirs were the first vehicles to reach the summit of the Mambila plateau. In one period of 321 days, the unit was on the move for 218 days. Another fact which is worth recording as a tribute to the determination of the survey team is that the Company which insured the staff investigating River Blindness assessed the eye risk so seriously that their premium was ten per cent of the amount assured. At the same time, a two-year survey was being conducted in Kenya and shorter investigations in the Aden Protectorate. The effect of these surveys, and of others made by Governments, has been to change the whole aspect of the problem by revealing not only its unsuspected size but also the comparatively inexpensive means by which it can often be tackled. Nevertheless, some of us will long remember the day in 1952 when, with less than £5,000 in the bank, the Society committed itself to a £40,000 survey in the hope that, for such an urgent task, the money would be found somewhere. That hope was not misplaced, for the whole cost was borne by voluntary subscriptions from firms in the United Kingdom and from thousands of individuals who were moved by the story of West Africa's 'Country of the Blind'.

In these directions, real progress has been made, but it is small in relation to the size of the task. Eye surgeons are doing more treatments than ever before, but last year at least two hundred thousand Commonwealth citizens probably went blind for lack of simple treatment and from diseases which could readily be prevented. In a few leading countries, comprehensive systems of education for the blind exist, but throughout the Commonwealth as a whole, not one blind child in a hundred is at school. Modern methods of rehabilitation offer a new life to the disabled, but still the mass of blind people in Africa and Asia live as beggars and family dependents, usually in a state of misery and want which is deplorable even by local standards. It might be said that such things are just one illustration of the fact that we live in a world where unequal resources make sharply contrasting standards inevitable. To my mind it is precisely in its capacity to challenge this situation that the Commonwealth has its greatest strength and its greatest chance to win the loyalty of the emergent nations. However, the point I want to make is that the problem of blindness is not in the 'wait for Utopia' category; a great deal can be done about it in the foreseeable future by using resources which are available within the Commonwealth and at a cost which is modest by international standards.

Obviously the most constructive thing that can be done about blindness is to prevent it, and the striking fact is that at least two-thirds of all the blindness in the Commonwealth is due to diseases which can nowadays be either prevented or cured. Trachoma and associated forms of conjunctivitis are the most prevalent cause. According to the World Health Organization, trachoma probably affects a quarter of the world's population. It is recorded as a major cause of blindness in twenty-six of the forty-four Colonies from which returns are available. In West Africa it is responsible for conditions such as I described in Kano's blind quarter and in East Africa 90 per cent of the members of some tribes have it. The Bible and the Koran bear witness to the antiquity of this disease in the Middle East,

and there are Arab villages where even to-day everyone has it during the epidemic season. Its ravages will be known to anyone who has served in Pakistan and India, and it has been estimated that a hundred million Chinamen have trachoma. You find it in the long-houses of Borneo and in the islands of the Pacific where, in Fiji, one Fijian in every eighty-five is blind. In an effort to assess the economic consequences of this disease, the W.H.O. some years ago took a census in Tunis which showed that in a single year it caused the loss of twenty-five million working days in that small and largely rural community. If you multiply that figure by at least a hundred, you might get some idea of the bill which trachoma presents annually to the emergent countries of the Commonwealth.

Until a few years ago, trachoma was virtually incurable, but now it can be successfully dealt with by modern drugs. After a survey in Kenya, an eye specialist concluded that a fifth of all the blindness in that country could be eliminated in five years, mainly through treating trachoma and conjunctivitis in the villages. Such results have already been achieved by Dr. Ida Mann in Western Australia, which was once known as the land of sand, sorrow and sore eyes. In South Africa, a six months' course with simple drugs in twenty-six schools reduced the trachoma rate by from 20 to 80 per cent. Last year scientists in London, working with blind volunteers, succeeded in isolating the trachoma virus. This achievement, with its promise of more effective remedies and possibly even of a vaccine, may open a new chapter in tropical medicine.

Equally hopeful is the prospect of controlling onchocerciasis, that unpronounceable scourge which we have renamed River Blindness. Fortunately it exists only in two continents, but its impact on the economic life of certain communities is difficult to convey to anyone who has not seen the stricken villages of Ghana, Nigeria, the Sudan, Kenya and Central America. Twenty years ago this disease was a medical mystery and even ten years ago there seemed a serious risk that hydro-electric schemes might cause it to spread to some of the most populous areas of Africa; now it is being successfully controlled by spraying infected rivers with insecticide. In Northern Ghana, where the disease has blinded thirty thousand people and has held up the economic development of the river community, our surveys have indicated that it could be controlled at a cost well within local resources and that early treatment could often save sight.

Cataract, which in most cases could be cured, is still the principal cause of blindness in many Commonwealth countries. Just one surgeon can often make a tremendous difference: Sir Henry Holland is said to have removed a hundred thousand cataracts in Pakistan, and in Antigua I met a doctor whose cataract operations had reduced the island's blindness rate by a third. Smallpox and leprosy still cause many people to lose their sight, but these too are coming under control. Beneath all this is the stratum of ignorance, squalor and poverty in which so many diseases have their origin, but it is surprising how often the factors which cause blindness can be isolated. In Eastern Malaya for example, blindness which was formerly attributed to malnutrition has been found to result from the practice of feeding children almost exclusively on unpolished rice as soon as they are weaned.

An opportunity therefore exists to prevent blindness on a massive scale, but

the decision to take that opportunity rests primarily with politicians and administrators, and only secondarily with doctors and social workers. Ophthalmic research has made dramatic advances, but still the Commonwealth spends only about £300,000 a year on research to prevent eye diseases which annually cost hundreds of millions. But a wonder drug is wonderful only in the hands of someone who can use it, and at present there is a startling shortage of eye doctors in the countries most affected by blindness. For example, throughout the Colonies there are not more than thirty Government eye specialists. The Society is doing its best about this with its new Scholarship Fund, but action on a much broader scale is needed. The specialist in his clinic is essential, but throughout Africa and Asia much of the blindness is caused by diseases which, if taken early enough in the villages, could be cured by well-trained orderlies with modern drugs. We propose to make an experiment on these lines and believe that such a mobile clinic could be operated for as little as £1,000 a year.

But whatever is done to prevent blindness, there will for generations to come be great numbers of people who are irrevocably blind. There are three million of them in the Commonwealth at present and at least a third are children and young people of working age. The extent to which this problem can be tackled, with results which benefit the community no less than the individual, is seen in the achievements of a few countries with advanced systems of blind welfare.

In Britain to-day, a third of all blind people of working age are employed, most of them in competitive, unsubsidized jobs. It has been estimated that they produce goods and services worth £5,000,000 annually. Blind people are holding their own in professions, commerce and industry. There are 495 blind shorthand typists who have taken the R.S.A. qualification. In factories blind workers do more than seven hundred different jobs in thirty-five major industries. Near here is a library with 300,000 Braille volumes in it; the Royal National Institute for the Blind, which last year produced half a million Braille volumes, periodicals and pamphlets, has an instrument with which blind engineers can measure accurately to a five-thousandth of an inch. All this started as a good cause, but it has long ago become a good national investment.

The most challenging task which now faces workers for the blind is that of adapting, to vastly different conditions, the techniques which have brought this new world of opportunity to the blind of a few advanced countries. In this, the Commonwealth, drawing on the unrivalled experience of its leading member countries, is making an outstanding contribution. The story covers ten years of pioneer work and all I can do here is to give a few snapshot impressions of what has been done and what now seems possible.

Near Lagos airport is the Ikeja Farmcraft Centre for the blind. There blind people from all the regions of Nigeria are learning to be farmers and village craftsmen. They dig, ridge and fertilize the land, plant, tend and harvest the crops. They know every yard of the sixty-five acres and can identify by touch the bewildering variety of crops. They make and thatch their own huts and farm buildings with mud, bamboo and concrete. In the workshops, sandals, straw hats and mats are made from locally grown material to sell at competitive prices

in village markets. We started this centre two years ago, and already the first blind farmers have returned to their villages, where they are supporting themselves and their families. Such centres now exist in Kenya, Uganda, Tanganyika, Northern Rhodesia and Nyasaland. They have shown that, with a few months of training, an illiterate blind tribesman—there are hundreds of thousands of them in Africa—can again become a productive member of his community. In the new centres which are now being planned in West Africa, it should not cost more to train a man to be self-supporting in this way than to maintain him in idleness for four years.

The same idea is now being followed in Asia. In Eastern Malaya, on ninety acres of jungle land, blind kampong workers are being trained to cultivate rubber. They call the place *Taman Harapan*, which I think means 'The Garden of Happiness'. In Bombay, one of our officers who is himself blind is at this moment helping to establish the first village training centre for the blind in India. Along the Rejang river in Sarawak, a typical Dyak long-house may soon be available as a novel training centre. But it is not only farmers who are being trained. In a Malayan fishing village, blind people supply the local community with nets and fishing tackle, and in Kenya the first blind tanners are now at work.

By such means blind welfare might be able to reach that multitude of blind people in rural areas whose need is not for Braille nor for sheltered workshops, but for a simple means of maintaining themselves in their own villages or tribes. So far this development has necessarily been on a small scale, but now that it has passed through the experimental stage it could rapidly be extended for the benefit of great numbers of blind people. We are sufficiently convinced about that to have decided to devote half the Society's available resources to this task during the next five years.

Such ideas are also influencing the planning of schools for the blind. Some of these schools have an interesting story behind them. A blind orphan girl left on a missionary's doorstep fifteen years ago inspired the fine school for the blind at Akropong in Ghana. A Rhodesian chief out hunting found a blind baby abandoned in the bush and started a school to make such things unnecessary in his district. In one place blind children helped build their own school by making bricks and draining a swamp.

During the next five years it should be practicable to double the amount of education for blind children in the Colonies. This would mean building a number of new schools and training eighty teachers, but even so would provide education for only 3 per cent of the children who need it. In countries such as Nigeria with at least 20,000 blind children, and Pakistan, where the number has been put at 80,000, traditional methods will never solve the problem. That is why, in January, one of our teachers is to start a three-year experiment in Nigeria with the education of blind children in ordinary primary schools. If this method succeeds, and it has already been outstandingly successful in America, the way should be open for a considerable advance.

Those of you who know Asia are unlikely to forget the spectacle of the blind beggars. You hear their whining voices in Lahore, Calcutta, Madras, Singapore

and many another city and, though some of them may be frauds, I know that most of them live in bitter poverty. In Hong Kong, blind beggars showed me where they sleep at night—beneath a piece of canvas stretched across the pavement. The only answer is some effective form of urban employment, and the traditional type of sheltered workshop, with its low earnings and heavy subsidies, is unlikely to be the answer. In Madras, eighty people, most of whom were previously beggars, are now making good earnings on an assembly line in a bicycle factory. In Karachi a factory has been started where blind people make cigarettes, and in Hong Kong and Singapore new and more productive types of workshop are planned.

The picture is such a large one that I will end by narrowing the focus to a single individual. Some of you may already have heard of Chan Poh Lin; she is a vivacious Chinese girl of 16. She lives in Sago Lane, in down-town Singapore, in an annexe to one of the Death-houses. Four years ago she went blind and deaf, and in all previous generations that would have ended her story. A blind teacher, Reuben Jacob, who had himself learnt Braille in a Japanese prison, was able by hand signs to communicate with her frightened and lonely mind. Gradually she learned the dots of the Braille Chinese alphabet, which would have been a creditable achievement for an expert teacher in a well equipped school. The girl's next step was an act of near genius; she decided to learn English, a language she had never known and could not now hear. By trial and error, by finding equivalent sounds in her own language, by an infinity of patience she spelt out, first words and then sentences in English. The other day I had a long letter from her in Braille; it was in fluent English and full of an extraordinary gaiety.

People often express surprise that our Society is a voluntary organization. In fact, our relationship with Governments is such that, as with most real movements, it is difficult to say where voluntary action ends and official action begins. It is one of the mysteries of the modern Commonwealth, and possibly one of its sources of strength, that only an unofficial organization could co-ordinate a movement such as this. Which Government department, for example, could be affiliated on the same terms with the Antigua 'Friends of the Blind' and with the Central Blind Welfare organization in India? Which department could accept responsibility for an overseas staff which works impartially in the Colonies and the Dominions and can on occasion even nip over into French territory to eliminate simulium flies? Under what sort of official formula could you arrange for a group of blind French Canadians to subscribe towards the cost of an English girl working amongst Chinese blind people in Hong Kong? Possibly that sort of mix up is to be expected in a Commonwealth which itself is a voluntary organization.

But there is a good deal more to it than this. In moments of official ceremony and pageantry, the Commonwealth can be magnificent, but it is at a lower level and in its unofficial relationships that it comes alive and grows. You cannot travel in Africa or Asia these days without sensing, often in places where you least expect it, a quickened interest in the Commonwealth idea. That interest is tentative, cautious and provisional, but it reaches forward to an association

which goes well beyond the formal links of Government or the requirements of strategy and trade. Such a wish can find its most natural expression in an organization such as ours, which has nothing to do with politics but has much to do with basic uncontroversial human needs.

DISCUSSION

THE CHAIRMAN: Having heard his paper, you will not be surprised to know that Mr. John Wilson has travelled some 200,000 miles round the Commonwealth and Colonies in the last ten years. He is just back from West Africa.

MR. P. K. SHAHANI: We have heard a very illuminating paper. I come from Pakistan and I can vouch for the fact that Sir Henry Holland made an immense contribution to the prevention of blindness in our country.

In Karachi five years ago we had one blind school, and now we have two. One blind school has been able to obtain a braille printing machine from California which makes possible translation into vernacular languages. As the lecturer says, it is quite true that our primary approach should be to the Government. After painstaking efforts the Government of Pakistan was persuaded to give a grant. But we still have a long way to go.

I should like to ask the lecturer what co-operation the Royal Commonwealth Society for the Blind gets from the Asian dominions.

THE LECTURER: It is only in the last year or two that our Society has been constitutionally able to do anything in the dominions, but we are now affiliated with the organizations for the blind in India and I hope we shall shortly be so in Pakistan. I was myself in India and Pakistan last year and I was struck by the problem you have there: about 350,000 blind, of whom 80,000 are children and young people. There are schools for about 170 of them. What I think might interest you is that only this morning John Jarvis, who is here with us to-day, told me of an experiment which has just started in Karachi, where blind children are beginning to be educated in ordinary primary schools. The first effort is to teach the teachers to cope with this new experience, and this is a good example of collaboration. I think the R.N.I.B. has a braille primer which is suitable for the job. We have arranged to buy the necessary number of copies of the primer and they are to-day being flown out to Karachi, where they will be playing a part in this conference which the teacher is organizing.

Of course the problem of prevention is the enormous one in Pakistan. I do not know how many of your people suffer from trachoma, but it must be something quite phenomenal. Sir Henry Holland told me that if only cataracts alone were cured (which is just a surgical matter) a third of the blindness in Pakistan could be stopped in a matter of five years. You ask what collaboration we get. I hope that in the future through international collaboration it will be possible to do three things to combat blindness in Asia. The first is a system of rural training in India, where there are something like two million blind who live in the villages. The second is this system of educating blind people in ordinary schools in Pakistan, and the third is a really practical type of urban centre in, probably, Hong Kong, which will help blind beggars to make a living. If those three things could be done in the next five years—and I think they could—it would be the beginning of a practical system of blind welfare in the area.

MAJOR NEIL MACMAHON, O.B.E. (Secretary, Gardner's Trust for the Blind): May I ask Mr. Wilson two questions? First, a local one: does he happen to have in his head any figures for the incidence of blindness in Uganda at present? I have in mind especially the danger of the simulium fly, which was first found in Jinja

many years ago. Secondly, now that the Empire is disintegrating, does he anticipate any difficulties as regards central control of blind welfare throughout the Commonwealth? I mean, for example, whether local societies, whether in Ghana or elsewhere, are likely to pursue their own independent measures as distinct from those now co-ordinated by his Society.

THE LECTURER: First, the extent of blindness in Uganda. There has never been a survey there, but I do not see why it should be any less than in the neighbouring territory of Kenya, where we now know there are approximately 65,000 blind; or why it should be very different from Tanganyika, where the number has been put at over 50,000. I should think it would be a fair guess to say that the number of blind in Uganda is not less than 50,000. A good deal of the blindness there is, as you say, caused by this onochocerciasis. At Jinja on the Ripon Falls there is as good a place as any to catch these flies. The measures against it have been fairly successful and I hope the blindness from that cause will be on the decline now.

Your second point was about the prospects for co-ordination in the future. You said 'now the Empire is disintegrating'; I would rather say, 'as the Commonwealth evolves'. As the Commonwealth evolves I think that the process of co-ordination will be different, certainly, but it need not be less effective. Take Ghana, for the example. Nine years ago we started a small committee, with Sir Henry Cousley as its Chairman. It grew, it became a branch of ours, and we encouraged it, as we encourage all our branches, to get away from us and become independent. It became the Gold Coast Society for the Blind. We had been working with it, and for it, and I do not think it made the slightest difference when Ghana became independent. I was in Ghana about two months ago and the relationship between our Society and that one is precisely the same. I really do not think that at our unofficial level these political difficulties which one encounters in so many other respects have much meaning. They just do not seem to inhibit us in the slightest, and I do not think that the problem of co-ordination, which is of course always difficult, will be any more difficult in the future than it has been in the past.

SIR BERNARD REILLY, K.C.M.G., C.I.E., O.B.E. (Chairman, Royal Commonwealth Society for the Blind): In conclusion of our proceedings I would ask you to join me in passing a vote of thanks to our Lecturer and to our Chairman. I have had the privilege of being connected with the Royal Commonwealth Society for the Blind for several years, and I know that most of the active work of the Society has centred round Mr. Wilson's energies and activities. He has not allowed his own blindness to interfere in any way with that work or with his travels throughout what used to be the Colonial territories, and since we have become the Royal Commonwealth Society for the Blind he has, as you know, travelled throughout the Commonwealth and right round the world. We are most grateful to him for what he has told us and we thank him heartily.

The vote of thanks to the Lecturer was carried with acclamation.

I ask you now to pass a hearty vote of thanks to our Chairman for carrying through this meeting to its very successful conclusion.

The vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.

DESIGNING, BUILDING AND SAILING YACHTS AND BOATS*

A paper by

UFFA FOX, C.B.E., R.D.I.,

read to the Society on Wednesday, 25th February, 1959, with Sir Alfred Bossom, Bt., LL.D., F.R.I.B.A., J.P., M.P., Chairman of Council of the Society, in the Chair

THE CHAIRMAN: This afternoon I think we are going to have one of the most interesting talks that any of us in this room has heard. Sailing and building boats, and making them do anything you want, is a feat that has been achieved by our speaker as well as almost anyone on the surface of the globe; I do not think I am exaggerating when I say that. In a breeze on salt water he is a piece of the ocean. I have known him well for many years, and the more I know him the more I like him. I am sure that after you have heard him this afternoon you will say the same.

The following paper, which was illustrated with lantern slides, was then read:.

THE PAPER

I begin by showing you the *Victory*. She is a marvellous old ship, and at the time of this photograph she lay afloat in the bay at Portsmouth before being put into her present dry dock. You see her great, wide yards; there would be as many as a 150 men on the foremast alone, as the Navy had men to fight as well as handle its ships. The next picture is of an East Indiaman (Figure 1.) We designed our boats in the old days so they could be careened over; that is, tilted over so that the keel and one side came out of the water. Then you could scrape and burn her off underwater, then paint or tar her; and after this turn the other cheek, and do the other side of her bottom. Above water they always showed the gun ports in plans and models because if you had guns shooting through one of your main and lower shrouds you would blow away all your rigging and lose your masts. So you see the lines below the water and the gun ports above. Our men knew all there was to know about design in those days—they still do—and we had to have ships that could sail upright and carry a lot.

Now we have a French privateer, *Bordelais* (Figure 2). On her first voyage she captured 27 English prizes. When the crew arrived home safely, they gave the designer and builder a good dinner, and he said that 'there was not a ship in the British Navy that could look at this privateer for speed, with the exception of the

* We regret that it has not been possible to publish this abbreviated version of Mr. Fox's paper at an earlier date and in the appropriate volume of the *Journal*.

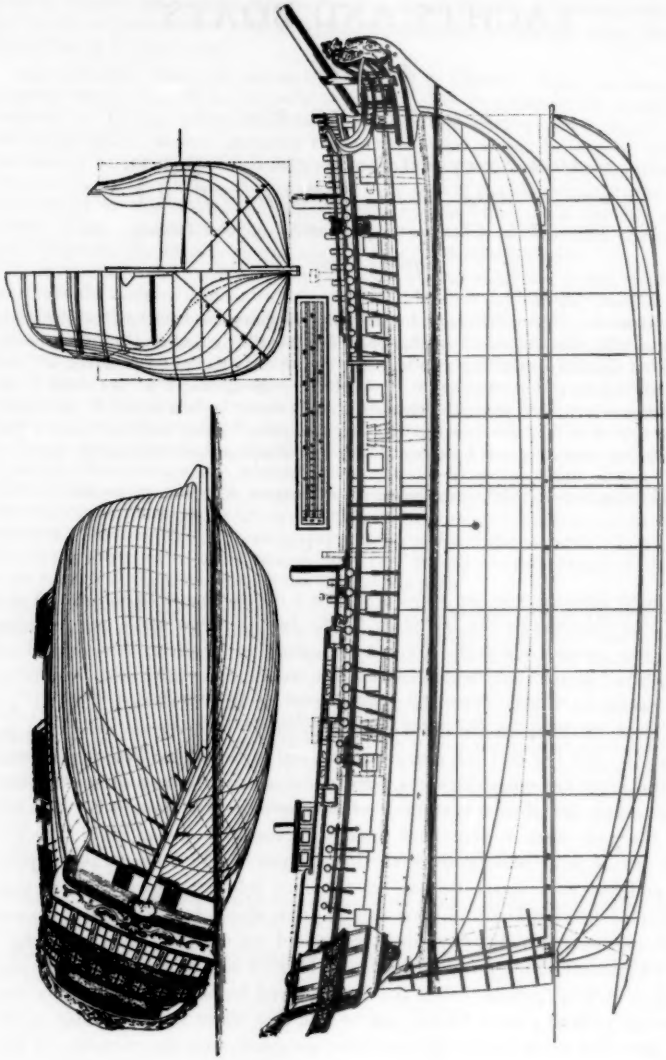

FIGURE 1. *English East Indiaman, showing her lines below water, gun-ports and rigging above water, and careened for bottom cleaning*

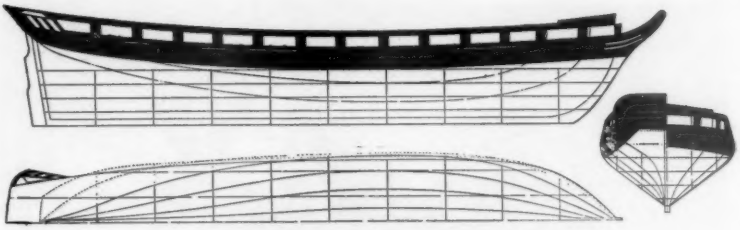

FIGURE 2. Bordelais, *showing lines below water and gun-ports above* (*cf. Figure 3*)

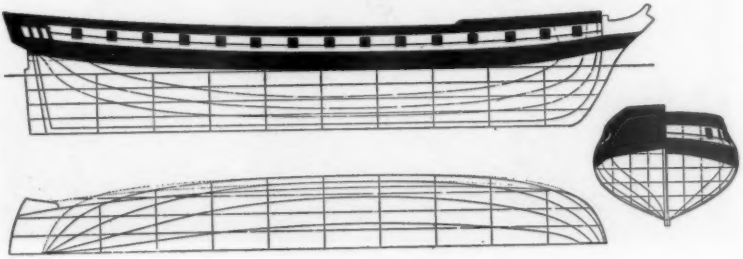

FIGURE 3. Revolutionnaire, *showing lines below water and gun-ports above* (*cf. Figure 2*). *The French vessels had a floor with a 45-degree rise, which gave them speed but made them wet and uncomfortable in blowing weather*

Revolutionnaire [Figure 3], and if *Bordelais* fell in with *her* in blowing weather and was under her lee, she would be taken'. On the next voyage, off the south-west coast of Ireland, the privateer saw the *Revolutionnaire* away up to windward. Off she ran, and after 14 hours the *Revolutionnaire* charged right alongside her, in a gale of wind, with all her yards and Lord knows what, carrying away, and captured her, so we acquired two fast ships. These French ships were fine in the bottom for speed, and so faster than our full bottomed vessels, and because in the sea battles of the Napoleonic Wars we often had to give chase, the fights always started between the prizes we had taken from the French and those they had taken from us, because they had captured our slow, robust ships and we their swift ships.

The *Revolutionnaire* was cut right away underwater with the bilge at an angle of about 45 degrees. She would not carry anything. Our fellows trying to blockade the French in these crank and wet ships used to get sick and ill; because these ships were so wet we sent them out to the West Indies, and stationed and used them there.

FIGURE 4. Suzanne

In 1860, because wages had increased so much (to 10*s*. a month), the ship-owners had to cut the upper and lower topsail, which had formerly been one sail, into two to save money. They never had to do that in the Royal Navy because they had to have enough men to fight a ship. The captain of the Foretop had 150 men under him on this one mast alone, so the Navy did not have to study economy.

Here we see a modern-looking schooner, the *Suzanne* (Figure 4). She is travelling in a gale of wind, sailed by a good crowd of men. To carry that amount of sail and handle it you have to be a perfect seaman. People say, 'So-and-so is a good helmsman', but helmsmen are ten a penny, like motor-car drivers, any one can do it. But the man who can maintain and build a motor car is a wonderful chap. So these seamen who handle all these sails and know what their vessels and gear will stand, in fair and foul weather, and know all the tides and winds, are gems of great price. This yacht-racing is sometimes dangerous, and often in the big boats you have to have a reef in your mainsail and no topsail set above in blowing weather. From the appearance of the *Lucilla*, a 12-metre, you can see the difference in the size of things nowadays. The boats which race for the America's Cup are very small.

FIGURE 5. Britannia *at her maximum speed*

Britannia (Figure 5), which was built for the Prince of Wales (later Edward VII), was a lovely ship. There has been little change in the design of sailing yachts since her day. All these deep-keeled, heavy displacement boats have a speed past which you cannot drive them. You can drive them up to that speed, but if you try to go beyond it they will drive under. When *Britannia* went to the Clyde, she would be towed by a destroyer. The captain would signal up and up with the speed, till finally at 13½ knots, he would say, 'That's it'. Then she was upright, of course, and a high wave used to be just washing to and fro across the deck. There was a Frenchman called Alain Gerabel who sailed across the Atlantic in a yacht. She was shipped back and he gave her to the French Navy, who towed her too fast and so pulled her under. So always, when you are up at your top speed you might as well reef and take things quietly, as you are only going to break things if you do not. *Britannia* had a reef and she used eyelets and a reef lacing. This is my favourite form of lacing because it equalizes the strain everywhere. If you have ordinary reef points you may tie one so much tighter than the other that it tears the sail, and if you shake out a reef and leave one tied down, again you tear the sail. A bootlace never gives trouble and takes a long time to chafe through; so is it with a reef lacing.

When Sir Alfred introduced me just now, he said I was a marvellous chap.

FIGURE 6. Avenger

I believe him, but I do not expect you to. The thing I did was to design boats that would get on top of the water and scoot over it. This makes the boat about three inches higher out of the water than she should be, and causes her to make a wash like a destroyer, and to go along at double her speed. That was what I did for designing; I just doubled the speed of boats off the wind in a breeze.

The shape that will carry most with the least resistance is circular in section, like a beer barrel and me. The fore sections amidships, and also at the stern of this vessel, are all circular: this has the merit of not only giving the least wetted surface, but when heeled over it keeps the same shape, so you have a balanced boat at all angles of heel. All existing designers were champions at this, so when I set out to design my planing boat it took me three years to defeat these designs.

After three years of development I designed *Avenger* (Figure 6) and finally perfected planing lines. This is an all-V'd boat. It has a V-shape forward and goes down with a deep chest one third of its length, like a wedge. When you squeeze a wedge of ice it jumps out of your hand, and when you drive a boat with a wedge

shape forward through the water it lifts up the bow and then cuts a fine groove. The rest of the boat, which is a long 'V', runs in this groove at double the speed it ought to run; and that was what I did in the design of planing fixed keel boats. It was just as simple as that, and we won 52 firsts, two seconds and three thirds in 57 starts—almost 'apossible'—and to win a string of prize flags like that you must sail jolly hard.

Having invented this boat that would go at double the speed, we had to invent a new form of sailing, because hitherto directly you reached your maximum speed you reefed, but we had to carry sail to drive *Avenger* beyond this and go at double the maximum speed. So on the wind we kept our jib in tight and played the mainsheet in and out, as if we were playing a heavy fish on a light line and rod in order not to break the line. You pretend that you are playing a fish and never have more wind in the sail than the boat can carry. The main sheet is eased away and only the bottom part of the mainsail is carrying wind. All the rest is fluttering like a flag, so we could ease the pressure in and out of the sail with the squalls. Directly we were off the wind the Lord would put all his wind into our sails, and off we would go, lifting out and scuttling along at double the then maximum speed.

We beat everything in this country, and then thought we would have a trial against the French. So we sailed across from Cowes to Le Havre—100 miles—quite a long way for a little boat. We went out in blowing weather, and so took our boat off the wind as much as we could. When you are sailing into the wind your own speed increases the wind, and at 45 degrees to the wind you are hittind into the waves quite often. But if you go off the wind a bit more you hit the waves at a slower pace, and also you are going up the crest of these waves on an easier incline.

We have rules for yacht designing and building. People ask why. The answer is, you must have rules in order to keep a sensible boat. When Oxford and Cambridge decided to race against each other over 100 years ago they took the two best boats they could find on the Thames, 8-oared clinker boats that carried passengers, and if the universities had stuck to that early type of boat the best crew would still have won, though they would not have gone so fast. Now the boat they race is no more than a toothpick! In sections it is exactly a circle, because that is the shape of least resistance.

Now we are going to do a bit of designing. I am using a thing called an integrator (Figure 7), which gives three answers on three different dials. From the answers on the dials you can make a graph. When the wind pressure comes into the sails of a boat she moves her centre of buoyancy out to leeward, just as if someone pushed me on the shoulder I would put my foot out to press against it, and the harder I was pushed the farther would my foot go out. The centre of gravity stays in the same place and the centre of bouyancy goes farther out to leeward as the wind pressure increases at different angles of heel. Most deep-keel vessels are stable even down to an angle of 120 degrees of heel and still come upright again.

From the graph you can say what the boat will carry. In winds of up to 24 miles

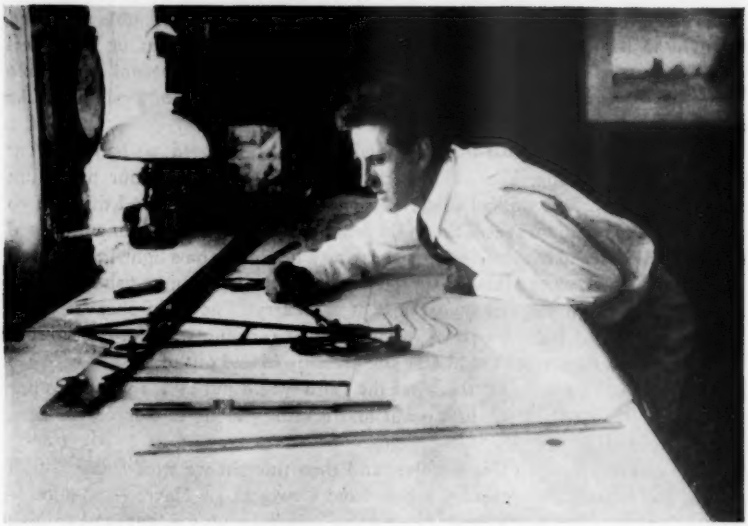

FIGURE 7. *Uffa Fox using his integrator*

an hour she carries all her sail, and at 27 miles an hour she takes in the jib topsail. At 29 she takes in the mizzen stay-sail. Now although at speeds of from 29 to 37 miles an hour the wind pressure is almost doubled, yet because the centre of pressure on the sail is lower, she can have almost the same area for double the pressure. Then you come down to using the mizzen stay-sail only. At 60 miles an hour you have only this up, and you wish you were home snug in bed!

You sometimes hear of people carrying full sail when it was blowing 70 miles an hour, and you go home and look at your own graph and think, well, you do not quite believe it.

One of the most important things in life is to keep your wind free and clear. There is only one position in sailing where it pays to be down to leeward, and that is close under the lee-bow of the opponent during a race, because then you are turning the wind at an angle of 45 degrees into the other fellow's sails.

People think this is a new idea, this lee-bow position, but it was known in 1790. Figure 8 shows the height of the battle known as the Glorious First of June. You can see our ship because of her flag, and when this picture was painted the officers of the ship said it was a libel, because if their ship had reached that position this Frenchman could never have escaped. She could not get in this position because she had lost her foretop mast. When they had had enough, the Frenchman sailed away out of it. But think of the fun they had, with fighting,

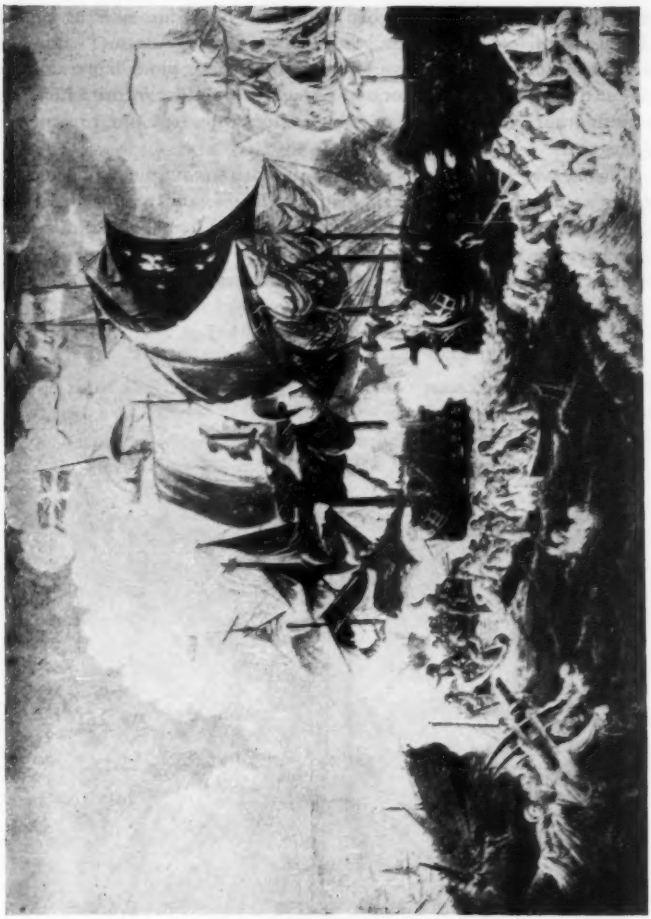

FIGURE 8. *This painting of 'the Glorious First of June', by P. J. de Loutherbourg, brings home the fact that leebowing was understood and manœuvred for as early as 1790*

firing the guns and all sorts of rowing events going on around. They fought all day long and only about 100 men were killed.

Now a little about the *America*'s Cup racing. In 1851, you remember, we had the first of all the big international exhibitions. It is difficult to believe now that America is sending rockets to the moon, for America in those days was a country of farmers, fishermen and seamen, and had nothing to put in the exhibition, so she sent the yacht *America* over. This did a great deal more good than anything else the Americans could have put in the exhibition, because that boat is still

remembered and is still news to-day, whereas most of what appeared in the exhibition is forgotten. The *America* had a high-cut bilge, just like the French boats, and a deep forefoot and rudder hung right on the very stern. That is how all the boats were until a chap in Essex—a man who made ploughs, not a naval architect—cut the forefoot away a lot and brought the rudder in from the stern to lessen wetted surface, and started the movement towards our present-day design of boats.

G. L. Watson, one of our most brilliant designers, continued this idea of cutting down wetted surface and friction in the *Thistle*, and produced, in that boat, sweeter, cleaner and easier lines. *Thistle* challenged for the America's Cup, but came home without it.

The final and perfected phase of this development came in 1893 with the lines

FIGURE 9. *Sail plan of* Britannia *showing her original rig, with the Jackyard topsail and reefing topmast in dotted lines, and in solid lines the Bermuda sail plan given her in 1931. 'There has been little or no change in yacht design since 1893', when G. N. Watson designed her for The Prince of Wales*

of the *Britannia*, designed for King Edward VII when he was Prince of Wales by G. L. Watson. The forefoot was cut away and the rudder came in more, all clean, pleasant and lovely; and there is no difference between the shape of *Britannia* and the yachts of to-day (Figure 9). In the 'Island' Sailing Club we have the model of *Britannia* which used to hang in her companionway, and alongside is a model of the Queen's and the Duke of Edinburgh's Dragon *Bluebottle*. The Dragon is 18 feet on the waterline and *Britannia* 81 feet, yet when you stand back and look at the two models, they are so alike that if somebody painted them in different colours, 99 of you out of 100 would not know which was which, because both models are of the same size.

In 1934 Sopwith went out to America and was defeated by *Rainbow*. There is no difference between the shape of *Rainbow* and *Britannia*, the sections are the same. *Rainbow* has her bow built out farther over the water to do away with the bowsprit and that makes her water-lines a little bit fuller, also her deck-line, and that is the only difference. So there has been little or no change in yacht design since 1893. Sopwith was a marvellous man, and he should have brought the Cup back, because his boat, *Endeavour*, was the faster, but the Americans were sharper on water, and although he won the first three races the Americans took the next four.

FIGURE 10. *A Norwegian-built 12-metre*, Vema III

FIGURE 11. Sceptre *in the* America's *Cup race, 1958*

Figure 10 shows a 12-metre. This is a Norwegian craft, but it is just what the 12-metres are like to-day, with accommodation. What we did with *Sceptre* (Figure 11) this year was to cut the deck away and then lift the floor up. That gave her several advantages. The weight of the deck went into a lead keel to make her more stable. The weight of the crew was lowered and that made her stiffer; the windage of the crew has been eliminated and they cannot fall overboard. It is quite easy to fall overboard from a 12-metre, so we put our fellows, and also the helmsman, inside. But for all that the Americans beat us, because, you see, our chaps had not had a race till they got over there. You all know that you can have a football team with a lot of good chaps, but until they have had about six or eight matches they are not a team, they are all players. Although our chaps were good,

FIGURE 12. *The stem for a lifeboat. The clean curved grain is generally found in the belly of an oak*

they were not a team, and their first race was against Americans who had already raced about 60 races.

The designer of the American boat was Olin Stephens, and on the day the design was ordered the American Syndicate asked Olin and his brother Rod to be part of the crew. The Syndicate had already settled on Briggs Cunningham as helmsman; he was in the 6- and 12-metres. They also engaged the skipper of the *Vim* that came over and cleaned up all the 12-metre races before the war, and Colin Ratsey, sailmaker, and Henry Sears. So they had six wonderful chaps, and between them they knew the answer to any problem on any sailing boat, however big or small. There was no dithering in America, there was half a crew on the day the design was ordered and they only had to find the other half; but our people here did not choose the crew until a week before they went to America.

Now you are going to start to build a boat. The picture (Figure 12) shows the stem for a Royal National Lifeboat, and you see the mould held up alongside. If you look at any oak tree you see that the branches are all curved and shaped. We designers like looking at trees, and we see the shapes of stems and all sorts of things in an oak tree in the winter. You always get the clean grain out of the belly, as the grain from this goes right through into the centre, right to the heart. The great piece of wood in the photograph weighed five tons.

It was brought down south all the way from Northumberland. Two men twist and turn it about with jacks and rollers and then they put it over the saw pit. The bottom sawyer starts at the sawdust end of the saw, with a handle called a box, and the top man stands astride the log. Together they saw right through this in all the required shapes and directions. Every so often when they are cutting through, the grain will start to pull the saw one way—then they take that saw out and put another one in that will fight against that grain. With all those saws they have the answer to any problem they are likely to meet. Although such a process is slow, it is the most economic way, because it enables them to get the utmost out of any piece of wood they are given.

Let us go cruising. We are going to sail from Norway down to Cowes. When you get high land you have deep water. In Norway there is high land and deep water; south at Holland there is flat land and shallow water. That is what makes the North Sea a terrible place in a north wind, because you get all these great seas coming in from the deep water being pinched tight sideways by the land, and underneath the bottom is rising, and this makes the seas racing south breaking and dangerous. It is a simple place to sail in, because when we left Norway all I did was to keep pretending I was in the middle, and when we got down to the southern end it was only 20 miles, and we could see land left or right and could steer for home. All I did was to take a noon sight with my sextant every day and pretend we were in the middle; it was no strain on the brain at all.

When we endured a heavy gale we hove to with a drogue (sea anchor) over the stern. Most people think a boat has to ride a wave by the bow, but that is like trying to drown a cat in milk, because all the windage above is forward. There are the high bow and the mast and bits and pieces of rigging, all trying to blow away from the wind. Then underneath the water the boat has a deep keel aft, and that is trying to hold her stern to the wind. So we put the rudder across her and took the waves on her quarter sharp corner, and we lived happily ever after, even through twenty-four hours of gale force wind from the North.

Now we are going to have a little race down in Devon for a bit of fun. It is the start of the Prince of Wales Cup in Plymouth 30 years ago when I was young. We had three days with no wind at all, and everybody down there fancied his chance in a strong wind, so I said, 'How about a little prayer tonight for a breeze of wind?' All agreed on that. When I went to bed that night I realized that I had put too many on the job, and I wondered what to do. I knew on the morrow we would be scuttling down to the first mark with a high wind, and if we had a collision there we could lose our mast, so I decided that we would start at lee end and, if I was not the first boat round I would be the last. That was what happened. I arrived sixth, so I waited and rounded the first mark last, and immediately after rounding tacked to port and then back onto the starboard tack. Soon I was the first boat, because all the other boats were interfering with each other, and quite a few lost bits and pieces of rigging on that first buoy and could not finish the race. We won, and only 13 out of 37 starters finished the race.

I am asked time and time again what it is like to sail and race with the Duke of Edinburgh. Well, there are two sorts of sailors in this world: those who have

FIGURE 13. *H.R.H. the Duke of Edinburgh sailing* Coweslip *at Cowes, 1958*

been brought up in boats—boat sailors—and those brought up in biggish yachts, and boat sailors are the boys. Prince Philip is a boat sailor, and probably the best we have in this country. In the picture I show, you will notice that we have put our spinnaker up, and not only that but we have got our jib set again in stops. When these nylon spinnakers collapse down on the stay, they wrap themselves round the wire so tightly you cannot get them off, and that is the end of it. Directly we get ours up we run the jib up to stop that happening. Some people even put up a jib made like a fishing net to stop the thing wrapping round.

The last picture of all (Figure 13) is of Prince Philip sailing at high-speed in

his Flying Fifteen *Coweslip*. You can gauge her hydro-planing speed by the white water flying.

ACKNOWLEDGEMENTS

Figures 4, 5, 6, 10, 11 *and* 13 *are from photographs by Beken & Son Ltd. of Cowes; Figures* 7 *and* 12 *from photographs by William White; and Figure* 8 *from a photograph by the Parker Galleries.*

DISCUSSION

In the first question, the Lecturer was asked to suggest a design for the next America's *Cup challenge race.*

THE LECTURER: A design? I am the President of the 6-metre Model Association, and we are going to give races for the 12-metre models too. The next design might easily be a model design because these chaps are keen on making new models and learning new things. We have the Rick Pond out at Hampton Court, so we will be sailing 12-metre models there. Anybody who wants to have a go at the *America*'s Cup has only to put a model in our races and see whether he is on the right line or not. Although you may take a boat through the tank and get a lot of answers on resistance and so forth, when you get them out sailing it is different. On a pond, you get the wind and waves and everything simulated as they are at sea, but you do not get any real answers. I do not know who might design a boat, but there will be dozens of them at it. What we must do is to see that the crew who go in for that Cup do not have their *first* race against a team sharpened up over dozens of races.

MR. A. POWIS BALE: Has Mr. Uffa Fox done anything in the way of camping on small boats? He ought to be able to tell us something interesting there, in his inimitable way.

THE LECTURER: We once had a 20-foot canoe called the *Brunnhilde*. We had a cockpit that was watertight, and there was just room in it for two of us to sleep, like sardines. We also had a tent. We went down the Brittany coast in her. The French thought such a lot of the canoe that they had her in the Paris exhibition in 1936. We sailed down to the Needles and wanted to wait till daylight, so we slept head and tail inside the cockpit, just inside the Needles, cold and miserable. We did not sleep much, and the next day we went across. It was blowing hard and we were terrified. When we got over there, one of us slept in the canoe with the tent over the boom, and the other in a tent on shore, and we had about a month of that. It was a marvellous time, because all day long we would frighten ourselves to death with big waves and fogs, and when it got to about 4 or 5 in the afternoon we would look at the chart and see where the best hotel was. We would go up to that place, have a hot bath, eat a wonderful dinner, and sleep in the hotel afterwards. So we had the two extremes, and you must have that. You see, if you have not been miserable you cannot be happy. You must be hungry to enjoy a meal, and if you have been frightened as well, it is all the better.

MR. ERIC J. HARRISON: I should like to ask if it is legend or true, Mr. Fox, that when racing was abandoned at Cowes when it was too rough, you sailed over to Cherbourg from that meeting to race over there?

THE LECTURER: That was when we went in a dinghy. It was blowing hard, and I will tell you what I did. You know that speech of Shakespeare's Henry V—'Once more into the breech'? You cannot make a speech like that in a little boat. So I said to the chaps with me, 'Do you think you could stick this for six hours?' And they were

annoyed, and said that they could stand a lot more than I could, and I also was annoyed—and we would rather have sunk than turned back.

DR. R. GAZE: All of the splendid pictures Mr. Fox has shown us, with one exception, I think, show boats made of wood. Nowadays there is a tendency to make things out of glass and plastics. What does the lecturer think of boats made out of plastics?

THE LECTURER: I am in great trouble here. I do not like the sound of any of this. I lost a lot of money making fibre glass boats. Some of these boats you have seen are 100 years old, and when wood is growing it bends to and fro, so it never fatigues. Metal does, you see. So far as steel ships are concerned, all big liners are finished when about 40 years old, as they all rust away. Whereas down at Cowes there was a boat called the *Bee* and she was still sailing and carrying cargoes when she was 120 years old. We know the virtues of wood and also its flaws, whereas with any new material a chap can come up and say, 'This does everything', but it might not. I used to believe that a glass fibre boat would not grow weeds, but if you look at the glass of water at home after a few days there is green grass on the inside of it. Glass is a very slippery material and the resin you use is very difficult to bind on to that slippery glass matt. Furthermore, glass is double the strength of wood, but it is also double the weight; therefore it has to be half as thick to have the same weight and strength. But when you have got down to that thinness it bends in and out and can fatigue because glass is a hard material. All things have their virtues and faults, like human beings. It is difficult to look into the future, but unless we get a better resin than we have now I do not believe glass fibre will endure, although I am designing boats in it and they are being built in America. I am quite pleased with the material, but I suppose I have sawdust in my veins, as well as salt water, and I like wood best of all.

MR. VINE: Following on from the last question, what are the considerations that a designer takes into account when deciding on the best form of timber?

THE LECTURER: Over that, we are very lucky, we have a firm called Lloyds and they set out rules. Lloyds Construction tells you just what sort of material you can use, and also they calculate the life of the ship based on whatever material you use. If you use one sort of wood, the ship's life is 10 years. If you use another it is 20. Before the war we used some jolly good wood like teak and mahogany. Then the war came and we ran out of all these things and had to find other woods not so good, so there are a lot of fancy woods about to-day, woods we would not have dreamed of using before the war. They are not all that bad, however. Of course, in places like Australia another lot of wood is used. Different places have different woods with characters. Broadly speaking, all timber is made of the same vegetable fibre, and all that fibre is the same weight, so if you have balsa wood, all honeycombed, you have a light wood and very little of it. But if you have teak, compressed as it is, then you have a very dense heavy material. But the fibres that make it are of exactly the same weight. If you could push that balsa wood down tight with a ram, as tight as teak, it would weigh the same amount per cubic foot. Roughly, the weight of the wood gives you its durability and its strength.

MAJOR A. M. FITZPATRICK-ROBERTSON: Mr. Fox has experimented with catamarans but he has not told us anything about them this afternoon. I wonder if he would like to say a word about them?

THE LECTURER: Catamarans have been in use for a great many years down in the South Sea Islands. Admiral Lord Anson discovered one down in the Islands and a model of it was made in Portsmouth in 1756. It did 20 knots. There is nothing new in catamarans. What is new is that we have now got enough young chaps sailing to endure this cold flying spray. When you are going along at 20 knots this spray is

like having a fire hose turned on you, and you have got to be tough to stand that. We have only just discovered enough men to put up with it.

A MEMBER OF THE AUDIENCE: Mr. Fox, do you see any future for the catamarans as cruising boats?

THE LECTURER: Have you ever capsized a catamaran?

THE QUESTIONER: No, not a catamaran.

THE LECTURER: It is a bit tricky if you do. A catamaran is very stable upright, and when it capsizes it is even more stable because now there is a mast and sail down there. [Laughter.] A Frenchman sailed across the Atlantic in a 60-foot catamaran built of steel. He went through the Midi Canal and came out at Bordeaux. When they had a first sail they lumped a lot of gear at her. Finally they got sail across all right, but she was a great big one and not very fast and it was pretty dreary sailing. But there is a future in it. I think what you have got to have is a big deflated balloon at the top of the mast, and down on the deck a CO_2 bottle and immersion switch so that when the mast hits the water it blows the balloon up and that fills the balloon up. Then when you are upright and have finished with that you squeeze the balloon down again and connect up another bottle.

THE CHAIRMAN: We must thank Mr. Uffa Fox for giving us one of the most entertaining afternoons we could find anywhere. He speaks with frankness on a subject on which he is an absolute master, and he does not object to pulling your leg a bit. He belongs to the sea. When you get him on the land you have a real prize.

Thank you very much Mr. Fox. We hope that some day when you have invented your new catamaran which will stay on top you will come and tell us all about it.

A vote of thanks to the Lecturer was carried with acclamation, and the meeting then ended.

GENERAL NOTES

THE CIVIC TRUST COUNTY AMENITY AWARDS, 1959

The Civic Trust announce that eighty-two awards and fifty-two commendations have been made under the County Amenity Award scheme which they initiated this year in conjunction with the County Councils of the United Kingdom. The object of the scheme is to encourage owners, architects, engineers, planners, builders and the public to take a greater interest in the appearance of their towns and villages by drawing attention to recent achievements in this field.

The competition now described was open to schemes completed during the last three years within the area administered by the County Council participating, and there were two classes of awards (in the form of Certificates): Class I, for the new building, or group of buildings, in the design of which most regard had been paid to their relationship with their surroundings; Class II, for other types of development making the best contribution to the improvement of the local scene—such as the restoration of an historic building, the landscape treatment of a park, or a road improvement scheme.

The total number of entries received was 669, which the Civic Trust regard as an encouraging response to this, the first, competition. The type and quality of the entries varied considerably. In one or two counties, the Assessors (who had been nominated by the President of the R.I.B.A.) reported that many of the entries could almost be taken as examples of what not to do. In other counties, the entries had

a bias towards the good architecture of a single building, whereas the Trust is more anxious to stimulate interest in the appearance of town or village street as a whole. On the other hand, where awards and commendations were made, the high quality and variety of the schemes were considered very satisfactory. Six road improvement schemes were amongst the winning entries, which also included petrol-filling stations, shops, public lavatories, 'bus shelters, information kiosks, pavilions and other small structures.

In view of the papers on 'Power Production and Transmission in the Countryside: Preserving Amenities' recently read to the Society by Sir Christopher Hinton and Sir William Holford (and due for publication in the next issue of the *Journal*), particular attention may be drawn here to the award made to part of the Hydro-Electric Scheme at Dolgarrog, which was carried out by the Central Electricity Generating Board. In this connection, the report on the competition issued by the Civic Trust observes:

> Any Authority that seeks professional advice of the standard evidenced here is to be congratulated; engineering structures treated as sensitively as this entail no destruction of the countryside. Unfortunately it will probably be a long time before a line of pylons is likely to receive an Amenity Award, but it would be nice to see one entered for the competition, indicating that careful thought had been given to the route chosen from the amenity aspect. A scheme for the *removal* of overhead low voltage distribution cables at Petersfield, however, wins a 1959 Award and great credit is due to this effort to improve the local scene.

Next year the Civic Trust intend to hold a similar competition open to County Boroughs; and in the subsequent year, one open to London Boroughs.

MUKUL DEY EXHIBITION

At the Commonwealth Institute, South Kensington, from 9th to 31st January may be seen a comprehensive, retrospective selection of work by the distinguished Indian artist, Mukul Dey, lately Curator of the Gallery of Modern Art, New Delhi. In addition to original paintings and engravings, the exhibition will include many of his fresco copies made at Ajanta, Bagh, Sigiri and elsewhere in India and Ceylon.

The hours of admission will be as follows: Mondays to Fridays, 10 a.m. to 4.30 p.m.; Saturdays, 10 a.m. to 5 p.m.; Sundays, 2.30 p.m. to 6 p.m.

OBITUARY

MR. HOWARD COSTER

Mr. Howard Sydney Musgrave Coster, the photographer who specialized in portrait studies of men, died on 17th November, only a short time after his retirement from practice.

His early experience of photography was gained in the Royal Air Force, and in South Africa, where he established studios in Bloemfontein and Johannesburg. In 1926 he opened a studio in London, and his artistry with the camera soon attracted visits from people famous in many walks of life. Coster's pictures of them form a valuable record of the times, which is now in the keeping of the Central Office of Information. The National Portrait Gallery also possesses many examples of his work.

Coster was elected a Fellow of the Society in 1937. In two successive years, 1948 and 1949, he contributed to the *Journal* reviews of the Royal Photographic Society's autumn exhibition.

MR. JOHN S. ENTWISTLE

Mr. John S. Entwistle, who died at his home near Toronto recently at the age of 62, was the founder, and for thirty years the principal partner, of one of the

leading firms of public certified accountants in that city. He was a former President of the Public Accountants Council of Ontario, and of the Board of Governors of the C.P.A. Association of Ontario. In addition to his work for the accountancy profession, Mr. Entwistle took an active part in local commerce, and in politics on behalf of the Conservative interest. He had served as Chairman of the Toronto Board of Trade, and was a member of its executive council and a Director of the Ontario Chamber of Commerce. In 1943 he stood as Progressive Conservative Candidate.

Entwistle was elected a Fellow in 1948. An enthusiastic member of the Society, he was Honorary Treasurer of the Committee which, in Toronto in February, 1955, organized the Bicentenary Banquet, the first official function of the Society to be held in Canada.

ADMIRAL SIR ARTHUR HALL

Instructor Rear-Admiral Sir Arthur Hall, K.B.E., C.B., who died on 21st November at the age of 74, was the first naval officer to become Director of the Education Department of the Admiralty, and in this post exercised a lasting influence on the organization and quality of training given in the service.

Arthur Edward Hall was educated at Swindon College and the Royal College of Science, where (after it became a constituent of the Imperial College of Science and Technology) he subsequently taught physics for six years. He entered the Navy as an instructor in 1915 and, whilst serving in H.M.S. *Inflexible*, saw the action at Jutland. After periods at the R.N. College, Dartmouth, and the R.N. Engineering College, Keyham, he became Fleet Education Officer to the Atlantic and Mediterranean Fleets in 1927, and in 1932 was appointed Deputy Inspector of Naval Schools. His promotion to the new post of Director of Education at the Admiralty was made in 1936.

On his retirement in 1945, Admiral Hall was made K.B.E. The next five years he spent at Greenwich as Director of Studies and Dean of the Royal Naval College. During this period he was also active in the affairs of the Institute of Naval Architects, the Navy Records Society and the Society for Nautical Research. Since 1943 he had been Chairman of the Royal School for Naval and Marine Officers' Daughters.

Admiral Hall's services to education extended beyond the Navy. During the war he was a member of Lord Hankey's Committee on Further Education and Training. He was twice Chairman of the English Association, a Governor of the Imperial College of Science and Technology, and Chairman of the British Society for International Understanding. He became a Life Fellow of this Society in 1946.

NOTES ON BOOKS

THE HISTORY OF THE ROYAL SOCIETY. *By Thomas Sprat. A reproduction of the 1667 edition, edited, with an introduction and notes, by Jackson I. Cope and Harold Whitmore Jones. St. Louis, Washington University Studies; London, Routledge and Kegan Paul, 1959. 50s net*

In spite of the ninety-four years which separate the two foundations, students of the early history of the Society of Arts can find much that is familiar in Sprat's *History of the Royal Society*. Improved methods of raising sheep and planting corn, 'the propagating of fruits and trees', the transplanting of vegetables, the cultivation of silk in North America, the discovery of dyestuffs and new 'mechanic arts', bulk as largely in his pages as they do in 'Dr. Templeman's Transactions' or in Dossie's *Memoirs of Agriculture*. The international and socially comprehensive membership praised by Sprat and, in regard to the second qualification, favoured by King Charles II in his command to the Royal Society not to exclude tradesmen, was to be put into practice by the 'Noblemen, Clergymen, Gentlemen and Merchants' who

were to hold their first meeting at Rawthmells in 1754. The repository of the Society of Arts was also anticipated. 'The *Royal Society*', wrote Sprat, 'will be able by degrees, to purchase such extraordinary inventions, which are now close lock'd up in *Cabinets*; and then to bring them into one common Stock, which shall be upon all occasions expos'd to all men's use.' And in another passage he used words which Shipley probably was to read and certainly was to echo: 'That it is the Tru concernement of *England* . . . to advance its Industry in peaceful *Arts*; to increase its *people*; to improve its own *Manufactures*; [and] to introduce the forein, of which our soil is capable.'

By the beginning of the eighteenth century the Royal Society had become more concerned with speculations into 'the just reason of things' than with the utilitarian discoveries urged on them by Sprat. The encouragement of these was to become the 'distinct province' of the Society of Arts—to quote a phrase used by Templeman in 1760, when a foreign correspondent had taken the two societies for one. Yet, as H. B. Wheatley once pointed out, the Society of Arts made an important departure from the example of the Royal Society in its method of rewarding inventions by premiums and bounties. This method was not new in 1754, but it cannot be found in Sprat. The first Parliament of Charles II was active in the consideration of economic matters and Sprat, although he distrusted 'Paper Commands', noted with approval the large volume of legislation which it accomplished. He also expressed confidence in the King's attempt to regulate the national dress. In the 1660s there was still a possibility that the Privy Council might resume the control over external economic affairs which it had exercised in the years before 1641. Even in the middle of the eighteenth century authors of proposals for economic improvements continued to advocate intervention by the Executive. Shipley, on the other hand, not only waged a personal war on the engrossers of coal in Northampton, but believed a society of private citizens should and could regulate the development of the national economy.

Much of the *History of the Royal Society* is occupied in defending the new philosophy against its critics: the scoffers who laughed at the strangeness of the experiments and the orthodox who saw in scientific inquiry a speedy way to perdition. The founders of the Society of Arts, although subject equally with the Royal Society to the barbs of 'Sir' John Hill, had no need to parade their piety before their contemporaries. The eloquence and wit of the Bishop of Rochester had long since justified their confidence.

As the tercentenary of the Royal Society's formal establishment approaches, interest in Sprat's *History* will increase. The American and British publishers and the scholarly editors are to be congratulated in making available an edition which, no less than the original highly readable text, deserves Cowley's praise for

'the comely Dress without the paint of Art'.

D. G. C. A.

THE NUDE IN ART. *Edited by I. E. Relouge; introduction by Bodo Cichy. London, Batsford*, 1959. 5 *guineas net*

Though the text of this album, indifferently translated from the German, leaves much to be desired, the fidelity of the colour reproduction of the masterpieces reproduced among the hundred full-page illustrations will commend the volume to anyone who delights to revive his museum experiences on the hearthrug. This study of *The Nude in Art* may well provoke a comparison with Sir Kenneth Clark's cognate treatise, and Dr. Bodo Cichy's shorter introduction to the subject could hardly be expected to survive that exacting test, even if the translation laid any claim to distinction of style. But allowing also for the fact that this treats simply of the female form (Sir Kenneth included the male), it may be agreed that this presentation of female beauty from distant Oriental conventions and the Greek ideal to the

idiosyncratic interpretations of our time is both well ordered and sufficiently ample to allow inquiring minds to pursue their own speculations.

The rendering of the female figure by classical, Gothic, and Renaissance artists, in the hands of the baroque and rococo artists, by the realist Courbet, or the bodeful painters of this century, can shed light on cultural backgrounds and beliefs no less than on the individual creative faculty. A dreamy lady on a terrace, a Mughal miniature from the Bodleian, can suggest as much about the artist's folk-tale tradition as it tells us of the perfection of his cursive line and serenity of mood. This Oriental voluptuary at her toilet under a crescent moon is introduced, one can be sure, less for her own sensual sake than as a vehicle for the artist's reverie about life under the ruler Aurangzeb, as eloquent as any writing.

It was likewise as a vehicle for extraneous, though altogether harsher emotions, that the female nude figure was frequently employed by the German expressionists in the first quarter of this century. There was, of course, no surer way for a generation in revolt, at odds both with the artistic and political climate of the time, to register its protest than by the most savage and angular distortions of a form revered by artists through the ages at least until the last decades of the nineteenth century in France. Professor Grohmann has reminded us that the Germans have always asked of art that it should be a *confession* and something more than art, something beyond pure form; and it is through his vehemence in transmitting his message—his sense of a primitive paradise lost, expressed in starkest terms in his *Two Girls in the Country* —that Otto Müller reveals his cultural background at the moment of revealing two nudes.

Cutting across race and time are, in fact, these two approaches: the imaginative power which, as we have seen, can make the undraped model simply a springboard for social or other ideas and, against this, the painter's intense concentration on what he perceives to be the essence of femininity, or the means of glorifying it. Renoir's *Girl Bathing*, beautifully reproduced from his seated figure in a Los Angeles collection, is a hymn of praise to the ripeness of youth, just that; and one could wish that space had been found for one of Matthew Smith's luxuriant nudes celebrating the same theme. Manet's *La Blonde aux Seins nus*, one of the finest half-nude portraits in French painting, combines candour with most graceful suavity of brushwork, while the famous *Reclining Odalisque* of Ingres is pure idealization of the body in the antique mode.

Our day has seen a widespread flight from the study of the human figure, at any rate in progressive painting; and indeed one might suspect that it is incapable of being charged with any fresh emotion that could be expressed either articulately, or with greater power than numerous innovators have demonstrated. But one never can tell.

NEVILE WALLIS

ELEMENTARY ASTRONOMY. *By Otto Struve, with Beverly Lynds and Helen Pillans. Oxford University Press*, 1959. 55*s net*

During the past few years, many astronomical books have been produced. Many of these are popular, and cater for the interested beginner; others are highly technical, and are aimed at expert readers capable of following advanced mathematical reasoning. Books which strike a happy mean are rare, and the appearance of the present volume is therefore most welcome. Its senior author, Otto Struve, is Professor of Astronomy and Director of the Leuschner Observatory at the University of California.

The style is extremely readable, and the book is a mine of information. Mathematics are included, but are comparatively elementary, and so may be followed by the non-specialist. There are numerous line drawings and photographs, all of high quality.

There are 33 chapters. Beginning with 'The Universe' and 'Fundamental Units',

the authors go on to consider the Earth and Moon, the planets, the minor bodies of the Solar System, the Sun, and the stars and star-systems; there is a chapter on Relativity, and another which deals with astronomical instruments. It is clear that every attempt has been made to bring the text thoroughly up to date, and a further strong point is that opposing theories are treated impartially. There are also many tables, giving useful information in a concise form.

It is true that the complete beginner will find difficulty with some of the mathematics, but even so he will find the book well worth reading, and will learn much from it. On the whole, however, the book will be most beneficial to university students and others who wish to make a serious attempt to learn and are prepared to concentrate. There can be few other works which cover so much ground at this technical level.

Each chapter is followed by a few selected problems, and solving these is an excellent test for the student; if he masters them all, he will be in a position to tackle some more advanced volume, and in case of difficulty he has only to refer back to the text. The print and presentation are of the satisfactory standard expected from the publishers.

A few minor criticisms may be made. The type-setting follows that of the United States edition, so that the spelling is American throughout; this does not matter in the least, but it would have been wise to amend some of the purely American terms and comparisons. This applies particularly to the term 'billion', which is always best avoided, since the British and United States 'billion' refer to different quantities. In this case the American billion is used, and there is no note of the difference, so that the unwary reader may possibly be misled. There are also some minor slips; for instance, the old South Tropical Disturbance on Jupiter, referred to on page 118, has not been seen for almost twenty years now, and the Bielid meteor shower, described on page 153, is now so inconspicuous that it may be said to be practically non-existent. A few other instances have been detected here and there in the text.

However, all these slips are unimportant. Enough has been said to show that the book is outstandingly good, and there can be little doubt that it will run to many editions. Authors and publishers are to be congratulated upon producing what may well come to be regarded as a standard work.

PATRICK MOORE

COCHIN SAGA. *By Sir Robert Bristow. London, Cassell,* 1959. 30*s net*

This has the makings of an extraordinarily interesting book; Sir Robert Bristow went out to India in 1920 as a marine engineer to take charge of the minor ports round the coast of what was then the Madras Presidency. Cochin was then merely one of them, rather larger than most, with a long history but no very great trading importance. He must have seen there a large and beautiful but shallow lagoon, with the island of Venduruthi in the foreground, and beyond it the town and island of Cochin, with a shallow opening to the sea at the northern end of the lagoon. When he left India in 1941, the island of Venduruthi had been extended northwards to form Willingdon Island, connected by bridges both to Cochin Island and to the mainland: the sea channel had been deepened to admit large ships, and a deep ship-channel dug between Cochin and Willingdon Island, with wharves on the island, facing the town. He had created the modern port of Cochin, no mean achievement, only accomplished after a long struggle with the officials of four Governments, the British Governments of India and of the Madras Presidency, and the Indian States of Travancore and Cochin, as well as with the old-established and conservative trading community of Cochin. If Sir Robert had been content to limit himself to telling the story of this struggle, of exactly what he set out to do and the various stages of its accomplishment, with much more detailed plans and photographs of the

port of Cochin itself, the story would have been of absorbing interest, particularly to anyone who knew Southern India in the closing years of the British Raj; but the outlines of the Saga are obscured by a long and rather involved section on the early history of Cochin, and an immense amount of personal and domestic material with long verbatim conversations between himself and the various personages of the story. It is, indeed, the saga of Sir Robert Bristow, rather than of the Cochin Port, still less of the port in relation to the rest of South India, and particularly to its other ports. Perhaps he could never have achieved what he did if he had not concentrated on one idea only, to the exclusion of everything else; but the result is not a balanced picture. He does not discuss at all the question of the areas served by the different ports of South India, and his references to the Port of Madras are most misleading. He attributes to Madras a hostility to Cochin, as a potential rival, which is quite unsupported by facts, since the two serve quite different areas and both have enjoyed a parallel increase in trade which still continues, with Madras appreciably ahead all the way. He attributes the same hostility to the railway authorities, who, he suggests, developed the port of Goa in opposition to Cochin, though in point of fact the development of the port of Mormugao (the modern Goa) took place some thirty years earlier. Finally, he is less than fair to his successor, the present Administrative Officer, in quoting 'a Press Report published in Devon and Somerset', attributing to him statements which the original copy of his speech shows clearly he did not make. So far from failing to mention the British conception and design of the port, Mr. Venkataraman expressly spoke of 'Mr. Bristow (later Sir Robert) the real architect of the port'. It was, indeed, a great achievement, and one would like to have heard more about it.

GODFREY ARMSTRONG

BRITISH COMMONWEALTH COINAGE. *By Howard W. A. Linecar. London, Ernest Benn, 1959. 30s net*

The Commonwealth is taken back to 1601; the mother country, as too familiar, is excluded, though its currency was legal tender throughout the Empire. The coinages of the smaller islands within the four seas, Man, Jersey and Guernsey, are included. Those of Ireland prior to 1928 are specifically excluded, but two earlier Irish coinages, one of them illegitimate, are lengthily dealt with under North America because—like many other coins—they were imported into the Plantations. After many interesting accounts of irregular coinages, including the comic issue by the owner of Lundy Island, the reader learns with surprise on page 255 that 'another rule which was set at the beginning of this book was that it would deal only with official regal issues'. This nonchalance is symptomatic.

A description of the designs and peculiarities of the coins issued for or by each territory that fell under British control is preceded by a skeleton history and followed by a list of the mints of provenance and a table of the dates borne, and metals used for each date and denomination. The mint lists are sometimes missing, as for New Guinea, or incomplete, as for India and Ceylon, and lump together standard suppliers and those to which resort was had in isolated emergency. The nomenclature of metals is erratic. 'Nickel-bronze' is used indifferently for cupro-nickel, which is white, and for nickel-brass, which is yellow, though both these terms are also freely used, and are further varied to copper-nickel and copper-zinc. Amongst complete errors in classification, the higher denominations of British West Africa were not nickel-brass till 1938 nor those of New Zealand silver after 1946.

The Virginia coppers of 1773, the one fully legal issue, are overlooked in the full account of pre-Revolution American issues. A worse omission in what purports to introduce the study of a corpus is the complete absence of reference to changing monetary theory. The seventeenth and eighteenth centuries expected the bullion

value of new gold and silver coins to equal their face value, without even deduction, in England after 1665, of coinage costs. The small English silver coinage was further subsidized after 1700. As a corollary, any gold or silver coin could circulate anywhere, and distinctive colonial coinages were unpractical, except for tokens; and tokens commonly provoked turmoil. Relaxation of these doctrines permitted the issue in the early nineteenth century of ¼, ⅓, and ½ farthings and of 1½*d.*, 3*d.* and 4*d.* silver pieces, while their abandonment eventually made it profitable for territories to start distinctive coinages instead of importing sterling. Economics, not home policy, account for the paucity of early, and multiplicity of recent, issues.

Mr. Linecar has compiled from sources not readily accessible a mine of information, especially on the older issues, but this, the heart of his book, is occasionally marred by such inaccuracies as that part of Wood's Irish coinage was struck in the Royal Mint. All was minted in Wood's works in Bristol.

The book is not illuminating as a synopsis nor wholly dependable as an inventory. Its most charming feature is the reproduction, which could hardly be bettered, of 340 coinage designs, from old and rare to contemporary.

JOHN CRAIG

SANDWICH COURSES—*For Training Technologists and Technicians. By P. F. R. Venables. London, Max Parrish,* 1959. 18*s net*

The Royal Society of Arts during the nineteenth century was a pioneer in promoting evening classes for technical education. From those early beginnings and in less than a century the whole fabric of English technical and commercial education has been built up. Evening classes have now largely been replaced by one-day-per-week attendance—the so-called day-release system. With the continual extension and growth of technical knowledge a mere one day per week is not enough. Courses based upon such meagre provision have lengthened up to 8, 10 or more years to reach the stage of final qualification.

The 'Sandwich' course—so called by reason of the alternation in 'layers' of both works experience and college study—has therefore been devised to provide more time and to give a well-balanced form of education and training. By 1958 there were 327 such courses in which over 7,000 students were in attendance. This is a movement which will provide a means of development for technical education over at least the next half-century. It is most timely therefore that Dr. Venables, as Principal of the Birmingham College of Technology, should with Mr. Ratcliffe, one-time Chairman of the Education Committee of the Institution of Production Engineers, have produced this volume. It is well written and amply documented. Both the college aspect and the industrial problems are capably dealt with. It is a book which everyone connected with technical training should possess and read.

HUGH A. WARREN

LIBRARY ADDITIONS

Fellows and Associates are reminded that they may borrow up to five books at a time from the Library and retain them for a month. Members living outside London may borrow books by post. Books sent by post are despatched at the cost of the Society and returned at the cost of the borrower. Books marked with an asterisk are part of the reference library, and not normally available for loan.

LIBRARIES, MUSEUMS AND SOCIETIES

GEIKIE, *Sir* ARCHIBALD—Annals of the Royal Society Club, the record of a London dining club in the eighteenth and nineteenth centuries. *London, Macmillan & Co.*, 1917.

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ENGINEERING, TRADE AND INDUSTRY

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ARTS COUNCIL OF GREAT BRITAIN—Housing the arts in Great Britain: report. *London, Arts Council of Great Britain.* Part I: London, Scotland, Wales, 1959.

FORMAN, ROBERT—Over the drawing board: an introduction to architectural draughtsmanship; illustrated by the author. 2nd ed. *London, Cleaver-Hume Press*, 1959.

MAUGER, PAUL—Buildings in the country: a mid-century assessment. *London, Batsford*, 1959.

PRICE, BARBARA [MARY]—Technical colleges and colleges of further education. *London, Batsford*, 1959.

VIOLLET-LE-DUC, EUGÈNE—How to build a house, an architectural novelette, translated by Benjamin Bucknall. *London, Sampson Low, Marston, Low and Searle*, 1874.

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BAYLEY, THOMAS—Model making in cardboard. *Leicester, Dryad Press*, 1958.

BOSTOCK, JAMES—Roman lettering for students. *London, Studio Publications*, 1959.

BURT, *Sir* CYRIL [LODOWIC]—A psychological study of typography; with an introduction by Stanley Morison. *Cambridge, Cambridge University Press*, 1959. Presented by Beatrice Warde.

GLOAG, JOHN [EDWARDS]—Advertising in modern life. *London, Heinemann*, 1959.

HARVEY, ARTHUR EDWARD—Trade draughtsmanship and drawing office procedure. *London, Batsford*, 1959.

KIEWE, HEINZ EDGAR, *editor*—The marriage of the medieval and the modern in Aubusson tapestry design: a symposium. *Ship St., Oxford, Art Needlework Industries*, 1958. (*Craftsman and designer guides, No.* 7.)

LONDON, COUNCIL OF INDUSTRIAL DESIGN—The management of design: a report based on papers read at the second Design Congress. *London, Council of Industrial Design*, 1957.

LONDON, VICTORIA AND ALBERT MUSEUM—Wedgwood Bi-Centenary Exhibition, 1759-1959; 23rd June to 30th August, 1959. *London, H.M.S.O.*, 1959. (*Catalogue of the exhibition.*)

MAYNE, JONATHAN—Barnett Freedman. *London, Art and Technics*, 1948. (*English Masters of Black and White Series.*)

FROM THE JOURNAL OF 1860

VOLUME VIII. *13th January*

PENNY READINGS FOR THE WORKING CLASSES

A series of readings have been recently given at Ipswich for the working classes, the admission to each reading being one penny. At the last reading of the season, an address was delivered from which it appears that for some years Mr. T. S. Gowing had entertained the idea of interspersing readings with the lectures of the Ipswich Mechanics' Institution; but it was only be degrees that he arrived at the conviction that a more popular form might be given to these readings, and that through them that most numerous and important class of the community might be reached, to whom it was obvious that the lecture, in any shape yet given to it—and even when gratuitously offered—possessed no attraction.

Mr. Gowing mentioned his ideas to several gentlemen, among others to Mr. Alderman Cowell . . . It was not, however, till last year, when Mr. Sulley was consulted, that any approach was made to a practical solution of the question.

After many discussions between Mr. Gowing and Mr. Sulley, and aided by the experience obtained in the Elocution Class of the Institution, established last winter under their guidance, the way was at length seen to commence the Weekly Penny Readings in the distinctive form they have since assumed; i.e. of a variety of reading and readers on the same evening.

. . . Hoping that their success might stimulate others to make similar attempts, the managers stated some of the principal points which their experience warrants them in considering as essential to success.

I. That the pieces should be varied in character; complete in themselves; and so arranged as to afford, by contrast, mutual relief.

II. That no piece should exceed half-an-hour in length, while the majority should be much shorter.

III. That purely didactic pieces should be introduced either at the beginning, when the senses of the audience are fresh, or towards the middle, when a certain amount of repose may be advisable.

IV. That learned and far fetched allusions should be resolutely sacrificed, as well as all unnecessary or questionable passages.

V. That everything should be read with well-considered expression, so as to bring out clearly the descriptive beauties, the passion, the pathos, or the mirthful excitement characteristic of each selection.

VI. That the aim should be to reach men more through the imagination and the feelings than by direct didactic instruction.

VII. That it is inexpedient to introduce more than two or three untried readers on the same evening.

From the list given in the Report it appears that in the course of 13 evenings, 28 gentlemen have read no less than 102 carefully selected pieces from a great variety of the best authors. And when it is considered that the managers have been obliged to leave the choice of the pieces almost entirely to the readers themselves; to have always a fortnight's readings prepared beforehand; that they have had to listen to the directly opposite complaints, on the one hand that the pieces were too light, and on the other that they were too heavy; and that the whole scheme was a new one—and consequently there was no experience to guide them, there seems to be no doubt that the managers have had a very difficult part to play.

The balance-sheet shows that these Penny Readings, unlike most schemes of the kind, instead of having to depend on external pecuniary assistance, have enabled

the managers to defray all expenses connected with them, and yield a good profit besides; so that instead of paying to the Mechanics' Institution the sum of £9 15s, the amount agreed on for the hire of the room, they have had the pleasure of contributing twenty-five pounds to its funds. . . .

Some Activities of Other Societies and Organizations

MEETINGS

MON. AND TUES. 28/29 DEC. Science Museum, South Kensington, S.W.7. John Cain: *From tinfoil to tape: the history of the gramophone.*

TUES. 29 DEC. Architects, Royal Institute of British, 66 Portland Place, W.1. 3 p.m. Percy Johnson-Marshall: *The rebuilding of cities* (1st Lecture).
Radar Association, at Royal Society of Arts, John Adam Street, W.C.2. 6.30 p.m. Dr. K. R. Sturley: *High quality sound broadcasting.*

WED. 30 DEC. Architects, Royal Institute of British, 66 Portland Place, W.1. 3 p.m. Percy Johnson-Marshall: *The rebuilding of cities* (2nd Lecture).

WED. AND THURS. 30/31 DEC. Science Museum, South Kensington, S.W.7. Victor Wall: *The story of flight.*

MON. 4 JAN. Public Health Engineers, Institution of, at Caxton Hall. R. J. Stephenson: *Interpretation of water and sewage analysis for public health engineering.*

TUES. 5 JAN. Commonwealth Society, Royal, Northumberland Avenue, W.C.2. 1.30 p.m. A. B. Agard-Evans: *Special libraries in India.*
At 6.30 p.m. Gerald Durrell: *A Zoo in my luggage.*
Petroleum, Institute of, 61 New Cavendish Street, W.1. 5 p.m. *Flow properties of Admiralty fuel oils.*

WED. 6 JAN. Building Centre, Store Street, W.C.1. 12.45 p.m. Film Show: *The new V brick. Packaged bricks at the brickworks.* The Building Research Station.
Civil Engineers, Institution of, Great George Street, Westminster, S.W.1. 6.30 p.m. Dugald Clerk Lecture: Capt. H. R. Cooper: *Dredging equipment.*
Engineering Designers, Institution of, Queens Hotel, Birmingham. 7 p.m. T. Ellerby: *Measuring and gauging equipment.*
Radio Engineers, British Institution of, at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. 6.30 p.m. Professor D. G. Tucker: *Some new possibilities in civil underwater echoranging-current research at the University of Birmingham.*

THURS. 7 JAN. Commonwealth Society, Royal, Northumberland Avenue, W.C.2. 1.15 p.m. Joint Meeting with the Royal African Society. Vernon Bartlett: *The awakening of the Afro-Asian nations.*
Electrical Engineers, Institution of, Savoy Place, W.C.2. 5.30 p.m. H. G. Bell: *The protection of electrical systems.*
Refrigeration, Institute of, at Institute of Marine Engineers, Memorial Building, 76 Mark Lane, E.C.3. 5.30 p.m. H. Heckmatt: *Some lubricating problems of refrigerating machines using Refrigerant 12.*

FRI. 8 JAN. Chemical Society, at North British Station Hotel, Edinburgh. 7.30 p.m. Detective Chief Inspector L. K. McLellan: *Chemistry applied to criminal investigation.* Joint Meeting with the Royal Institute of Chemistry and the Society of Chemical Industry.

SAT. 9 JAN. Interplanetary Society, British, at Lecture Theatre of the Science Museum, Exhibition Road, South Kensington, S.W.7. 7 p.m. *Assignment outer space; Down to earth; Sub-gravity tests in jet aircraft; Atlas in orbit; Space pioneer; Explorer in space.*

MON. 11 JAN. Chemical Industry, Society of, 14 Belgrave Square, S.W.1. 5.30 p.m. Joint Meeting with Oils and Fats Group. Dr. C. G. Dummer: *Emulsions in theory and practice.*
Transport, Institute of, Jarvis Hall, R.I.B.A., 66 Portland Place, W.1. 5.45 p.m. P. A. White: *The problem of the peak: Rail.* A. F. Neal: *The problem of the peak: Road.*

TUES. 12 JAN. Analytical Chemistry, Society of, at the Mason Theatre, The University, Edmund Street, Birmingham 3. 6.30 p.m. Dr. G. J. Minkoff: *Microgas analysis.*
Manchester Geographical Society, 16 St. Mary's Parsonage, Manchester 3. 6.30 p.m. R. Bottomley: *The rough-stuff Fellowship.* Iceland Exhibition, 1958.
Mechanical Engineers, Institution of, 1 Birdcage Walk, Westminster, S.W.1. 5.30 p.m. D. Downs: *Combustion chamber design and the influence of fuel quality.*

WED. 13 JAN. Building Centre, Store Street, W.C.1. 12.45 p.m. Imperial Chemical Industries Ltd., Plastics Division. Film Show: *Planning Daylight; Water on Tap.*
Central Asian Society, Royal, at the Royal Society's Hall, Burlington House, Piccadilly, W.1. 3 p.m. P. Reddaway: *A Landrover pilgrimage to Western Persia.* P. R. E. Willey: *The valley of the Assassins.*

THURS. 14 JAN. Chemical Society, at Department of Chemistry, The University, Bristol, 6.30 p.m. Joint Meeting with the Royal Institute of Chemistry and the Society of Chemical Industry. J. G. Graham: *Dyeing of the newer synthetic fibres.*
The Royal Institution, Albemarle Street, W.1. 7.30 p.m. Professor C. Kemball: *Progress in the study of heterogeneous catalysis.*
Commonwealth Society, Royal, Northumberland Avenue, W.C.2. 1.15 p.m. Godfrey Talbot: *Royal river*, the film of the Royal Tour of Canada.
Public Health Engineers, Institution of, at Caxton Hall. 6 p.m. W. G. Harper: *Coal preparation effluents and their treatment.*

FRI. 15 JAN. Chemical Society, at the University Chemical Laboratory, Lensfield Road, Cambridge, 8.30 p.m. Dr. J. C. Kendrew: *The Structure of Myoglobin.* Joint Meeting with the University Chemical Society.

SAT. 16 JAN. Interplanetary Society, British, at Hoare Memorial Hall of Church House, S.W.1. 3 p.m. Dr. N. H. Langton: *The scientific exploration of space.*

TUES. 19 JAN. Engineering Inspection, Institution of, Royal Society of Arts, John Adam Street, W.C.2. 6.15 p.m. Dr. H. Barrell: *Standard of measurement for engineering*
Locomotive Engineers, Institution of, at Institution of Mechanical Engineers, 1 Birdcage Walk, S.W.1. 5.30 p.m. R. C. S. Low: *Some aspects of railway braking.*

WED. 20 JAN. Building Centre, Store Street, W.C.1. 12.45 p.m. The Lead Development Association. *Lead the enduring metal.*

THURS. 21 JAN. Chemical Society, at the Chemistry Department, The University, Sheffield. 4.30 p.m. Professor E. R. H. Jones: *Some recent studies with natural products.* Joint Meeting with the Royal Institute of Chemistry and the University Chemical Society.
At The University, Aberdeen. 8 p.m. L. N. Savidge: *Synthetic detergent washing powders.* Joint Meeting with the Royal Institute of Chemistry and the Society of Chemical Industry.
Mining and Metallurgy, Institution of, at Geographical Society, Burlington House, Piccadilly, W.1. 4.30 p.m. J. H. Harris: *Serial-gravity concentration: a new tool in mineral processing.* P. D. R. Maltby: *Use of moving bed ion exchange in the recovery of uranium at Can-met Explorations, Ltd., Blind River, Ontario.*

WED. 27 JAN. Architects, Royal Institute of British, 66 Portland Place, W.1. One-day course of lectures for architects in conjunction with the Fire Protection Association: *Practical fire protection.*